TOWN OF DIXFIELD FLOOD PLAIN MANAGEMENT STUDY

OXFORD COUNTY, MAINE

Prepared By:

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In Cooperation With:

Town of Dixfield
Oxford County Soil and Water Conservation District
Maine State Planning Office,
Floodplain Management Program

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- Maine Department of Transportation (MDOT), Augusta, ME
- Maine State Planning Office, Floodplain Management Program, Augusta, ME
- National Oceanic and Atmospheric Administration (NOAA), National Weather Service (NWS), Asheville, NC
- Town of Dixfield, ME
- United States Army Corps of Engineers (USACE), Waltham, MA
- United States Geological Survey (USGS), Augusta, ME

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TOWN OF DIXFIELD
FLOOD PLAIN MANAGEMENT STUDY
OXFORD COUNTY, MAINE

INTRODUCTION

This Flood Plain Management Study (FPMS) report presents flood plain information for a number of waterbodies within the Town of Dixfield, Maine. These include Sevenmile Stream, Tucker Valley Brook, Hugh Brook, Butterfield Brook, Potash Brook, Newton Brook, Aunt Hannah Brook, Harvey Brook, and Paddy Meadow Brook. Data generated consists of a flood hazard evaluation, including flood plain maps and flood profiles, and options for flood plain management.

Technical information and recommendations provided in this report will be useful to the Town in identifying flood plain areas, as a guide for developing or improving a flood plain management program for the areas studied, and to update the Town's codes and zoning ordinances. The data generated from this study also will be useful to local, state, and Federal agencies, planning groups, engineers, consultants, and others involved in community planning and the design of hydraulic structures, channels, roads, bridges, culverts, and other community facilities.

The report also provides information needed to comply with Maine's 'Mandatory Zoning and Subdivision Control Law,' which applies to shoreland areas. This report will also facilitate more effective and consistent administration of the community's flood plain management ordinance. Such regulations are needed to minimize loss of life and property damage from future floods, prevent degradation of the watershed's environmental resources, and ensure orderly community growth in areas suitable for development.

NRCS conducted this study in response to a request by the Town of Dixfield to the Oxford County Soil and Water Conservation District (FCSWCD). The Town submitted a formal application for Federal assistance in developing an FPMS to the Maine State Planning Office, Floodplain Management Program, which establishes study priorities throughout Maine.

NRCS carries out these studies under provisions of Section 6 of Public Law 83-566, the Watershed Protection and Flood Prevention Act of 1954, as amended. Participants cooperated in developing a Plan of Work (POW) dated April 1997.

STUDY AREA

The Town of Dixfield is a small, rural community located along the Androscoggin River in the foothills of western Maine, about 60 miles north of the City of Portland, Maine's largest city (see **Figure 1**). U.S. Route 2, the major east - west highway in Maine, parallels the Androscoggin River, Newton Brook, and Sevenmile Stream in Dixfield. The 1990 U.S. Census indicates the town has a resident population of 2,574.

The total land area of the town is approximately 41.9 square miles. Land use is 96 percent forestland, 2 percent is open land including agriculture, and 2 percent is urban and residential.

NRCS has completed soil mapping of the entire Town of Dixfield and has published a soil survey report for Oxford County. Interested individuals may obtain soils information by visiting, writing, or calling the following NRCS field office:

USDA -- Natural Resources Conservation Service
Oxford Service Center
1570 Main Street, Suite #10
Oxford, Maine 04270
Telephone (207) 743-7019.

The Dixfield area receives a mean annual precipitation of 43 inches, which includes the water equivalent of 91 inches of snow. The precipitation is distributed evenly throughout the year; however, snowmelt accounts for a large part of the runoff. The mean annual temperature is approximately 43.3 degrees Fahrenheit (^{o}F). Monthly mean temperatures range from a low of 16.5^{o}F in January to a high of 68.0^{o}F in July.

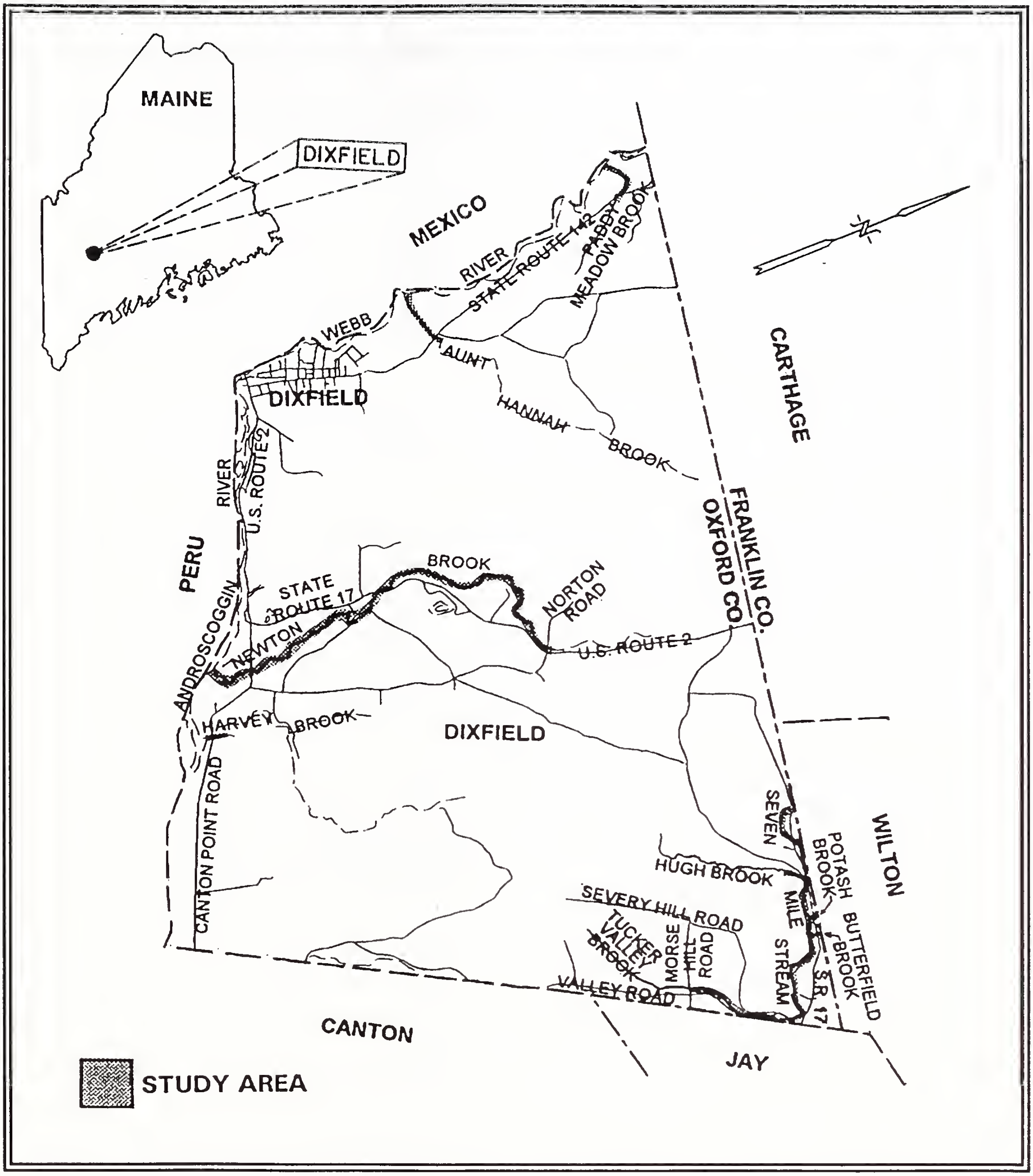

Figure 1 -- Location and Study Area Map
Dixfield, Maine

Dixfield is located entirely within the Androscoggin River watershed. Aunt Hannah Brook and Paddy Meadow Brook are tributaries of the Webb River and located in NRCS Hydrologic Unit 01040002100. Sevenmile Stream and its tributaries, Newton Brook, and Harvey Brook are tributaries of the Androscoggin River and are located in NRCS Hydrologic Unit 01040002100.

The town's topography consists mostly of hills and low mountains separated by narrow valleys. Elevation extremes range from 1,845 feet at the peak of Colonel Holman Mountain to 380 feet on the Androscoggin River at the Dixfield/Canton town line; most summits fall within the 1,000 to 1,500 foot elevations.

Dixfield's economy is closely tied to tourist-related recreational activities and the forest products industry.

Development is heaviest in and around the village centers of Dixfield and East Dixfield, and along U.S. Route 2. Development within the flood plains studied consists of single family homes, recreational properties, farmland, a ball field, a picnic area, roads, and bridges. The demand for land suitable for development has increased in recent years, resulting in additional pressures to develop flood plain property.

NRCS studied the following streams and pond in Dixfield: Sevenmile Stream, Butterfield Brook, and Potash Brook for their entire lengths within the community; Tucker Valley Brook, from the Dixfield/Jay town line to the Morse Hill Road, Hugh Brook from its confluence with Sevenmile Stream to a point approximately 0.3 miles upstream; Newton Brook from its confluence with the Androscoggin River to the Norton Road, Aunt Hannah Brook from its confluence with the Webb River to State Route 146, Harvey Brook from its confluence with the Androscoggin River to a point approximately 0.2 miles upstream, and Paddy Meadow Brook from its confluence with the Webb River to State Route 146.

Sevenmile Stream, a tributary flowing southeasterly to the Androscoggin River, has a length of 12.5 miles and a drainage area of 36.8 square miles at its confluence with the Androscoggin River in Jay.

Tucker Valley Brook, a tributary flowing northeasterly to Sevenmile Stream, has a length of 1.1 miles and a drainage area of 3.5 square miles at its confluence with Sevenmile Stream in northwestern Jay.

Hugh Brook, a tributary flowing northeasterly to Sevenmile Stream, has a length of 2.0 miles and a drainage area of 3.2 square miles at its confluence with Sevenmile Stream near East Dixfield.

Butterfield Brook, a tributary flowing southerly to Sevenmile Stream, has a length of 2.1 miles and a drainage area of 1.5 square miles at its confluence with Sevenmile Stream in East Dixfield.

Potash Brook, a small tributary flowing southeasterly to Sevenmile Stream, has a length of 1.2 miles and a drainage area of 0.8 square miles at its confluence with Sevenmile Stream in East Dixfield.

Newton Brook, a tributary flowing southerly to the Androscoggin River, has a length of 5.9 miles and a drainage area of 11.5 square miles at its confluence with the Androscoggin River in Dixfield.

Aunt Hannah Brook, a tributary flowing southwesterly to the Webb River, has a length of 4.1 miles and a drainage area of 5.3 square miles at its confluence with the Webb River in western Dixfield.

Harvey Brook, a tributary flowing southerly to the Androscoggin River, has a length of 2.0 miles and a drainage area of 4.2 square miles at its confluence with the Androscoggin River in Dixfield.

Paddy Meadow Brook, a tributary flowing northwesterly to the Webb River, has a length of 2.3 miles and a drainage area of 1.1 square miles at its confluence with the Webb River in northwestern Dixfield.

There are nineteen bridges and culverts on the streams studied in Dixfield. These include five on Sevenmile Stream, two on Tucker Valley Brook, one on Butterfield Brook, one on Potash Brook, seven on Newton Brook, one on Aunt Hannah Brook, one on Harvey Brook, and one on Paddy Meadow Brook (see **Bridge and Culvert Data**, Page 13, for further information).

Historically, there have been several dams located on the streams studied in Dixfield. Only the ruins of one remains:

- a concrete dam at the former Winderosa campground on Newton Brook.

Natural Values

Today's uses of the streams in Dixfield are primarily recreational and include such activities as: open water fishing, canoeing, and swimming.

Other popular activities in the area are small and big game hunting, cross-country skiing, bicycling, snowmobiling, picnicking, hiking, mountain climbing, fall foliage touring, camping, photography, and nature study. The watersheds of the streams studied support a wide variety of wildlife, birds, and fish, and provide a source of water for homes, businesses, and fire protection.

Flood Problems

Dixfield's flood history indicates that damages can occur at any time during the year, but particularly in the winter and early spring months following heavy rainfall on snow-covered or frozen ground; in summer following intense thunderstorms; and in summer and fall during tropical hurricanes.

The most recent serious flooding in Dixfield occurred in June 1998. The greatest known flood was that of April 1987 followed by those of 1936 and 1953. Damage caused by those floods and others has been to single family residences, businesses, recreational property, farmland, roads, and bridges. Stream bank erosion is also a problem during flood events.

Tables 1 and 2 summarize the approximate extent of flooding caused by the 100-, and 500-year events to structures and flood plain land.

Table 1 -- APPROXIMATE NUMBER OF STRUCTURES IN FLOOD PLAINS STUDIED		
STRUCTURE TYPE	100-YR.	500-YR.
RESIDENTIAL	2	2
OTHER	5	7
TOTAL	7	9

Table 2 -- APPROXIMATE FLOOD PLAIN AREAS (ACRES) [1]		
LOCATION / LAND USE	100-YR.	500-YR.
SEVENMILE STREAM		
Openland	22	23
Forest	53	63
Wetlands	7	7
Urban	1	1
TUCKER VALLEY BROOK		
Forest	12	12
Wetlands	3	3
Urban	1	1
HUGH BROOK		
Openland	1	1
Forest	2	2
Wetlands	1	1
SUBTOTAL	103	114

[1] *Classified by apparent primary land use. Does not include normal stream or pond area. Urban areas include commercial, municipal, residential, and recreational properties, and roads and bridges.*

Table 2 -- APPROXIMATE FLOOD PLAIN AREAS (ACRES) [1] CONT.

LOCATION / LAND USE	100-YR.	500-YR.
BUTTERFIELD BROOK		
Forest	3	4
POTASH BROOK		
Openland	1	1
NEWTON BROOK		
Openland	22	26
Forest	259	287
Wetlands	16	16
Urban	4	4
AUNT HANNAH BROOK		
Openland	2	4
Forest	8	13
HARVEY BROOK		
Openland	18	18
Forest	12	14
Wetlands	2	2
Urban	1	1
PADDY MEADOW BROOK		
Forest	13	14
Urban	1	1
TOTAL	**465**	**519**

[1] *Classified by apparent primary land use. Does not include normal stream or pond area. Urban areas include commercial, municipal, residential, and recreational properties, and roads and bridges.*

ENGINEERING METHODS

For the flooding sources studied in Dixfield, NRCS used standard hydrologic and hydraulic study methods to determine the elevation and areal extent of floods. Flood events of a magnitude that are expected to be equaled or exceeded once on the average during any 10-,50-, 100-, or 500-year period (recurrence interval) were selected as having special significance for flood plain management in the town. The common terms for these floods are the 10-, 50-, 100-, and 500-year frequency floods. Although this frequency designation does represent the long term average time between floods of a specific magnitude, floods do not occur at regular, predictable intervals. The more correct terms for these floods are the 10-, 2-, 1-, and 0.2-percent chance flood events, but this report generally will use the long-established and widely recognized ‘frequency’ designation.

Rare floods could occur at short intervals or even within the same year. When one considers periods greater than 1 year, the risk or probability of experiencing a rare flood increases. For example, the probability of having a flood that equals or exceeds the 1-percent chance (100-year) in any 50-year period is approximately 40 percent (4 in 10), and for any 90-year period, the risk increases to approximately 60 percent (6 in 10.) The analyses reported herein reflect flooding potentials existing at the completion of field surveys for the study.

Hydrologic Analyses

NRCS conducted detailed hydrologic analyses to establish the peak discharge-frequency relationships for each flooding source affecting the community. There are no stream gaging stations within the watersheds studied, and no meaningful surface water flow records exist.

Routine manual or computer-aided computations for subwatershed times of concentration and flood routing reach lengths were made with the aid of 7.5’ topographic maps. NRCS developed composite runoff curve numbers based on existing land use.

NRCS used the Technical Release Number 20 (TR-20) hydrologic evaluation model **(USDA, SCS, 1983)** to compute discharges on each stream studied in Dixfield. TR-20 is the designation for a watershed computer model entitled Computer Program for Project Formulation - Hydrology The program is a physically based event model that computes direct runoff resulting from any synthetic or natural rainstorm. It takes into account conditions having a bearing on runoff, develops a hydrograph, and routes the flow through stream channels, reservoirs, and natural storage areas. It combines routed hydrographs with those from other tributaries. The program includes provisions for hydrograph separation by branching or diversion of flow and the addition of baseflow. There is no provision for recovery of initial abstraction or infiltration during periods of no rainfall during an event. TR-20 does not have a groundwater component.

The program can compute peak discharges, their times of occurrence, volumes of runoff, water surface elevations, and duration of flows at any desired cross section or structure. It conducts detailed hydrologic analyses to establish the peak discharge-frequency relationships for each flooding source studied.

The TR-20 model used historical rainfall data for all evaluated frequencies. Modeled storms had a 24-hour duration and an NRCS Type I rainfall distribution.

Table 3, **Summary of Discharges**, shows a summary of the relationships of drainage area to peak discharge for each stream studied in Dixfield.

Hydraulic Analyses and Flood Plain Delineation

Detailed hydraulic studies were conducted to provide estimates of the elevations of floods of the selected recurrence intervals on each stream studied in Dixfield. NRCS's Water Surface Profile 2 (WSP2) computer program **(USDA, SCS, 1993)** provided information on elevation, discharge, flow area, and flooded area at specified locations along stream valleys. The program can compute up to 15 water surface profiles in one pass through the watershed. It uses the standard step method, with some modifications, to compute profiles between valley cross-sections. At a road crossing, it calculates head loss through a bridge opening, culverts, or a combination of them. It can compute flow profiles for subcritical and

Table 3 -- SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (MI.^{2})	PEAK DISCHARGES (CFS) 10-YR.	50-YR.	100-YR.	500-YR.
SEVENMILE STREAM					
Severy Hill Road	15.6	2,200	4,355	5,370	7,810
Church Street	13.0	1,965	3,850	4,745	6,870
U.S. Route 2, State Route 17	8.7	1,365	2,650	3,250	4,690
U.S. Route 2, State Route 17	8.6	1,375	2,650	3,250	4,675
Private Drive	7.1	1,245	2,355	2,875	4,090
TUCKER VALLEY BROOK					
Valley Road	3.3	625	1,160	1,410	1,995
Morse Hill Road	2.5	585	1,045	1,255	1,740
HUGH BROOK					
At mouth	3.2	590	1,130	1,380	1,970
BUTTERFIELD BROOK					
At mouth	1.5	305	590	735	1,035
POTASH BROOK					
At mouth	0.8	120	245	305	445
NEWTON BROOK					
Canton Point Road	10.6	830	1,610	1,955	2,860
Porter Road	9.6	830	1,590	1,930	2,805
U.S. Route 2, State Route 17	9.4	830	1,585	1,920	2,795
Private Road	7.3	825	1,545	1,860	2,670
Private Road	5.1	815	1,485	1,770	2,495
Private Road	4.7	815	1,475	1,750	2,455
Norton Road	4.4	815	1,465	1,740	2,430
AUNT HANNAH BROOK					
State Route 142, Weld Road	5.2	505	970	1,175	1,695
HARVEY BROOK					
Canton Point Road	4.2	605	1,085	1,285	1,795
PADDY MEADOW BROOK					
State Route 156, Weld Road	0.9	175	305	355	490

critical flow. The TR-20 program uses valley cross-section hydraulic ratings and structure ratings generated by WSP2 to reach-route flood hydrographs through valley reaches and reservoir route through storage areas.

NRCS conducted field surveys to obtain cross-section data for all streams studied in Dixfield. Crews surveyed all bridges, dams, and culverts to obtain elevation data and structural geometry (see Table 4, **Bridge and Culvert Data**, page 13).

The **Flood Profiles** and **Flood Hazard Area Maps** show the locations of selected cross sections used in the hydraulic analyses.

The hydraulic analyses for this study assumed that flow was unobstructed. The analyses did not consider the effect of ice jams. The flood elevations shown on the profiles are thus valid only if hydraulic structures remain unobstructed, and do not fail.

The reference for all elevations is the National Geodetic Vertical Datum of 1929 (NGVD). **Flood Hazard Area Maps** show the locations of elevation reference marks used in this study. Table 5, **Elevation Reference Marks**, on pages 14-17 contains reference mark descriptions.

The boundaries of the 100-, and 500-year floods shown on the **Flood Hazard Area Maps** were delineated from elevations determined at each cross section. Between cross sections the boundaries were interpolated using topographic maps at a scale of 1:24,000 and contour interval of 20 feet, and aerial photography. Field survey information, engineering computations, and other data pertinent to the study are on file and available for review at the following location:

USDA -- Natural Resources Conservation Service
5 Godfrey Drive
Orono, Maine 04473
Telephone (207) 866-7241.

Table 4- BRIDGE AND CULVERT DATA [1]

LOCATION	CHANNEL BOTTOM ELEV.	LOW CHORD ELEV.	ROAD OVERFLOW ELEV.	FLOOD ELEVATIONS 10-YR.	50-YR.	100-YR.	500-YR.
SEVENMILE STREAM							
Severy Hill Road	417.0	425.9	427.1	425.7	427.9	428.0	429.7
Church Street	476.9	488.4	487.3	483.7	487.9	489.2	490.7
U.S. Route 2, State Route17	508.7	520.4	525.4	514.5	518.6	520.1	521.9
U.S. Route 2, State Route17	534.6	546.3	563.0	541.3	545.4	547.3	549.9
Private Drive	553.8	562.3	559.8	561.7	562.8	563.2	563.9
TUCKER VALLEY BROOK							
Valley Road	519.4	527.4	526.8	527.4	528.5	528.9	529.5
Morse Hill Road	599.9	607.9	610.7	607.8	611.5	611.9	612.6
BUTTERFIELD BROOK							
U.S. Route 2, State Route17	470.3	476.2	478.2	475.8	476.5	477.3	478.5
POTASH BROOK							
U.S. Route 2, State Route17	484.3	490.1	491.0	488.0	490.1	491.1	491.9
NEWTON BROOK							
Canton Point Road	387.4	398.9	401.7	403.5[2]	407.8[2]	409.2[2]	413.4[2]
Porter Road	457.8	467.3	469.9	466.8	470.9	471.3	472.0
U.S. Route 2, State Route17	461.9	469.4	473.1	468.7	473.4	473.9	474.6
Private Road	481.5	487.1	487.1	488.3	489.1	489.4	490.3
Private Road	494.5	499.2	499.6	500.6	501.3	501.5	502.1
Private Road	518.5	525.4	525.0	526.0	527.2	527.7	528.6
Norton Road	567.0	574.7	577.6	575.2	579.2	579.8	580.8
AUNT HANNAH BROOK							
State Route 142, Weld Road	434.5	444.1	445.7	439.2	441.7	442.7	445.0
HARVEY BROOK							
Canton Point Road	380.0	390.2	394.3	401.1[2]	405.4[2]	406.8[2]	411.0[2]
PADDY MEADOW BROOK							
State Route 142, Weld Road	450.1	453.1	457.4	457.9	458.3	458.4	458.7

[1] *Elevations in feet NGVD, at upstream end of bridge or culvert opening.*
[2] *Backwater from Androscoggin River.*

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Table 5 - ELEVATION REFERENCE MARKS (RM)		
RM #	ELEV. [1]	DESCRIPTION OF LOCATION
RM 1	429.08	Chiseled square, painted orange, on top of the south end of the east concrete abutment of the Severy Hill Road bridge over Sevenmile Stream.
RM 2	476.20	Horizontal nail in steel disk, set in the base of CMP pole # 74/23, 0.3 miles northwest along State Route 17 from its intersection with Severy Hill Road, in the southwest face of the pole, 40 feet northeast of the centerline of State Route 17 and approximately 1 foot above ground level. Opposite private road leading southwest.
RM 3	480.21	Horizontal nail in steel disk, set in the base of CMP pole # 84/13½, 0.8 miles northwest along State Route 17 from its intersection with Severy Hill Road, in the northeast face of the pole, 34 feet southwest of the centerline of State Route 17 and approximately 1 foot above ground level.
RM 4	479.80	MDOT standard tablet, stamped "2341, 1991", on top of the west end of the downstream concrete headwall of the U.S. Route 2 and State Route 17 bridge over Butterfield Brook
RM 5	492.22	Chiseled square, painted orange, on top of the north end of the downstream concrete curb of the Church Street bridge over Sevenmile Stream.
RM 6	526.363	MDOT standard tablet, stamped "2910, 1991", on top of the northeast end of the upstream concrete headwall of the U.S. Route 2 and State Route 17 crossing Sevenmile Stream. Located just upstream of the confluence of Hugh Brook.

[1] *National Geodetic Vertical Datum of 1929.*

Table 5 - ELEVATION REFERENCE MARKS (RM)		
RM #	ELEV. [1]	DESCRIPTION OF LOCATION
RM 7	550.11	Chiseled square, painted orange, on top of the east end of the downstream concrete headwall of the U.S. Route 2 and State Route 17 crossing of Sevenmile Stream. Located approximately 0.5 miles west along U.S. Route 2 from the confluence of Hugh Brook.
RM 8	563.17	Horizontal nail in steel disk, set in the base of CMP pole # 3/605/3, 0.2 miles southwest along Science Hill Road from its intersection with U.S. Route 2 and State Route 17, in the southeast face of the pole, 15 feet northwest of the centerline of Science Hill Road, and approximately 1 foot above ground level.
RM 9	572.74	Chiseled square, painted orange, on top of the northeast end of an 18" concrete culvert, located approximately 300 feet northwest along U.S. Route 2 and State Route 17 from the Dixfield/Wilton town line.
RM 10	527.54	Stamped "002", painted orange, on top of the upstream end of the 8' by 11' structural plate pipe arch culvert at the Valley Road crossing of Tucker Valley Brook.
RM 11	607.58	Stamped "001", painted orange, on top of the downstream end of the 8' by 11' structural plate pipe arch culvert at the Morse Road crossing of Tucker Valley Brook.
RM 12	401.82	Chiseled square, painted orange, on top of the northeast concrete wingwall of the Canton Point Road bridge over Newton Brook.
RM 13	467.30	Stamped "002", painted orange, on top of the upstream end of the 9.5' by 15' structural plate pipe arch culvert at the Porter Road crossing of Newton Brook.

[1] *National Geodetic Vertical Datum of 1929.*

Table 5 - ELEVATION REFERENCE MARKS (RM)		
RM #	ELEV. [1]	DESCRIPTION OF LOCATION
RM 14	473.14	Chiseled square, painted orange, on top of the northeast concrete wingwall of the U.S. Route 2 and State Route 17 bridge over Newton Brook.
RM 15	671.27	Horizontal nail in steel disk, set in the base of NET&T pole #166 and CMP #146, 1.9 miles north along U.S. Route 2 and State Route 17 from its intersection with the Canton Point Road, at the intersection of a private road west, in the southwest face of the pole, 24 feet northwest of the centerline of U.S Route 2 and State Route 17, 42 feet northeast of the centerline of the private road, and approximately 1 foot above ground level.
RM 16	519.91	Horizontal nail in steel disk, set in the base of NET&T pole #15-1 and CMP #15.1, 0.4 miles northwest along Holman Road from its intersection with U.S. Route 2 and State Route 17, in the northeast face of the pole, 34 feet southwest of the centerline of Holman Road, and approximately 1 foot above ground level.
RM 17	576.33	Stamped "111", painted orange, on top of the downstream end of the westernmost of three 6' diameter CMP culverts at the Norton Road crossing of Newton Brook.
RM 18	445.74	Chiseled square, painted orange, on top of the northwest concrete wingwall of the State Route 142 bridge over Aunt Hannah Brook.
RM 19	389.88	Stamped "001", painted orange, on top of the downstream end of the 11' by 16' structural plate pipe arch culvert at the Canton Point Road crossing of Harvey Brook.
RM 20	429.47	Topmost point on 6' by 6' by 6' granite boulder, located on the east side of the Webb River at "The Falls", next too a sand beach, and opposite Fuller cottage.

[1] *National Geodetic Vertical Datum of 1929.*

Table 5 - ELEVATION REFERENCE MARKS (RM)		
RM #	**ELEV.** [1]	**DESCRIPTION OF LOCATION**
RM 21	453.09	Stamped "001", painted orange, on top of the upstream end of the southernmost of two 3' diameter CMP culverts at the State Route 142 crossing of Paddy Meadow Brook.

1 National Geodetic Vertical Datum of 1929.

FLOOD PLAIN MANAGEMENT

The watershed topography dictates to a large extent the flood problems that occur in Dixfield. Natural drainageways on the hills form numerous tributaries to streams studied. The steepness of their watersheds produces very quick and flashy flood peaks.

Natural channels draining the uplands erode and become deeper due to steep channel gradients and high velocities. Flatter gradients and lower velocities in the valleys deposit the eroded material in sand bars in the channel. As a result of the erosion and deposition process, and debris and ice jams, valley channels tend to fill in and become wider.

Historically, transportation systems tend to follow streams and rivers because of ease of access and construction. Towns develop along streams at sites where industry built dams for water power. The transportation system and towns are subject to flood damage when they lie within the flood plain. Development in outlying areas usually occurs along existing roads. This is the case in the Town of Dixfield.

Flood Damages

The streams studied in Dixfield have experienced flooding on numerous occasions. Flooding occurs at least annually and sometimes two or three times per year. Flooding usually occurs during heavy rains in winter and spring. Ice and debris jams further compound the problem.

Damage in the study areas is primarily to farmland, roads, bridges, homes, and recreational properties.

Flood damages consist of two main types:

- losses resulting from direct contact with flood water; and

- losses resulting from people being isolated due to the flooding of roads.

Damages resulting from direct contact with flood water include residential, agricultural, and road damages. Residential damage consists of flood water and deposition on the first floor and incidental damage to lawns and out buildings. **Table 1** shows the approximate number of buildings within the flood plain. All houses in the flood plain are in low hazard areas as defined by FEMA (see **Glossary** for definition). Agricultural damage consists of streambank erosion, deposition of sediment and debris on fields, and fence damage. Damages to state and town roads consist of debris and ice jam deposition, scour holes in the pavement, and washed out fill and culverts.

The single road access to several areas along Hugh Brook, Newton Brook and Sevenmile Stream have the potential of isolating approximately 50 people, and about 15-20 homes during a flood. Included in this group might be infants, elderly, and people with medical problems. The safety and health of these people are in jeopardy because fire protection, medical, and essential services, such as public utilities and oil deliveries are not available until the floodwater recedes. Those affected are not able to go to Town to buy groceries and students can not attend school. Businesses lose income, employees lose wages, and residents incur extra vehicle maintenance expense.

Flood Plain Management Options

The management options that follow provide general information on the various means of flood protection and the reduction of monetary loss caused by floods. These options fall into two major categories: nonstructural and structural. Not all options will apply in Dixfield. With further study, the Town or individuals may find viable options to reduce flood losses. Considerations in this evaluation include:

- whether the area is in a high or low hazard area;
- engineering feasibility;
- economics;
- effect on flooding elsewhere (induced flood damages); and
- social acceptability.

Nonstructural Measures

Nonstructural measures cannot prevent flooding, but they can help reduce future problems and monetary loss. The implementation of nonstructural measures should have little to no effect on the environment.

1. Floodproofing

Floodproofing is any measure that property owners may take to minimize flood damage to their property. The following are some of the more common means used to floodproof buildings:

- elevating the building above expected flood levels;
- application of waterproof sealant to foundations and permanent closing and sealing of lower openings;
- construction of earthen dikes or masonry floodwalls around the building to prevent water from entering it;

- installing water tight closures that can be quickly and easily placed over doors and windows;

- protection of appliances and utilities, such as furnaces, washers, dryers, and electrical and plumbing systems. Elevate the appliance or place it in a water proof bag to protect it from rising flood water.

Several buildings in Dixfield could benefit from floodproofing. Property owners should consider the following when selecting the most appropriate measure or combination of measures:

- the depth, velocity, and duration of flood flows;

- the benefit-to-cost ratio of the measure;

- engineering feasibility;

- soil types; and

- local codes and building restrictions.

The Federal Emergency Management Agency's (FEMA) publication, <u>Design Manual for Retrofitting Flood-prone Structures, FEMA 114, 1986</u> contains additional information on floodproofing. Interested parties can order the publication at no cost by writing to the following address:

Federal Emergency Management Agency
P.O. Box 70274
Washington, DC 20024
Attn: Publications

2. Purchase or Relocation

In areas where all other means of flood protection are ineffective or impractical, federal and state funds may be available to buy properties or relocate buildings and their occupants. After removal of the buildings, use the land for recreation or some other purpose not significantly affected by floodwater.

This option applies to existing houses in the flood plain. This approach is most desirable from a flood plain management perspective, but it may not be socially acceptable.

3. Land Use Regulation

Use this option to keep future development out of the flood plain. The Town can acquire conservation, scenic, or flood control restrictions or easements in flood hazard areas where little or no development is desirable. Land use restrictions prevent development that is incompatible with public objectives, while allowing continued private ownership of the land. Certain future land rights, such as construction of buildings in the flood plain, could be purchased from present land owners. Permitted uses could be farming, wildlife, low intensity recreation, and woodland. Land use restrictions may also result in a lowering of the landowner's tax assessment.

In 1971 the State of Maine enacted the **Mandatory Zoning and Subdivision Control Law**, Chapter 424, Sections 4811 through 4814 of the Maine Statutes. The law requires all municipal units of government to adopt zoning and subdivision control ordinances for shoreland areas. Shoreland areas include land within 250 feet of the normal high water mark of any pond, river, or salt water body. This includes a major portion of the flood plain.

The Town has zoned the flood prone area to prevent future development. Although development is restricted in the flood plain, growth continues to occurred in the uplands as people desire to live “in the country.” The result is isolation of more people during future flood events.

The Town should consider the preparation of an overall land use plan to enhance the natural and recreational values of the areas studied in Dixfield. The plan would set integrated objectives for public access, historic sites, recreational facilities, and the preservation of significant wildlife habitat areas.

Other general recommendations include:

- maintain wetland and flood plain vegetation buffers to reduce sedimentation and delivery of chemicals to the water body;

- support agricultural and forestry practices that minimize nutrient flows into water bodies;

- support proper use of pesticides and fertilizer;

- minimize soil erosion on land within, or adjacent to, flood plains, on forest road systems, and at timber harvesting operations; and

- dispose of spoil and waste material in a manner that would not contaminate ground and surface water or significantly change land contours.

Additional technical information on voluntary natural resource protection measures is available from the local OCSWCD office at 1570 Main Street in Oxford, telephone (207) 753-5789.

4. Flood Insurance

Dixfield has been a participant in the 'regular' phase of the National Flood Insurance Program (NFIP) since 1985. This program enables existing home owners within the 100-year flood plain to buy up to $245,000 worth of flood insurance on their home and contents at subsidized rates. Up to $550,000 worth of insurance can be obtained for multifamily homes and small businesses.

As part of the program, the Town must require a building permit for all proposed construction within flood-prone areas and review the permit to ensure that the site is reasonably free from flooding. It also must require that structures in flood-prone areas be properly anchored and that recommended construction materials and methods be used to minimize flood damage.

Home owners in flood prone areas should protect themselves from monetary loss with flood insurance. The Town should ensure that property owners in or next to the flood plain are aware of the availability of Federally subsidized flood insurance under the NFIP. Policies and information on coverage and rates are available from most insurance agents.

5. Floodways

Any encroachment in the flood plain will reduce its flood carrying capacity. Examples of encroachment include the placement of earthfill and the construction of buildings in the flood plain. The reduced capacity caused by the encroachment results in increased velocities and flood heights. Flood hazards, both upstream and downstream of the encroachment itself, generally increase.

One aspect of flood plain management involves balancing the economic gain from flood plain development against the resulting increase in flood damages. Under this concept, the 100-year flood plain is divided into a floodway and a floodway fringe.

The floodway is the main channel of the watercourse plus any adjacent flood plain areas that must be clear to pass the 100-year flood without substantial increases in flood heights. FEMA minimum standards limit such increases in flood heights to 1.0 foot, provided that hazardous velocities do not result.

The floodway fringe includes the remainder of the flood plain that can be obstructed without increasing the 100-year flood elevation by more than 1.0 foot. This approach allows some development while protecting the existing flood plain. Typical relationships between the floodway the floodway fringe and their significance to flood plain management are shown in Figure 2.

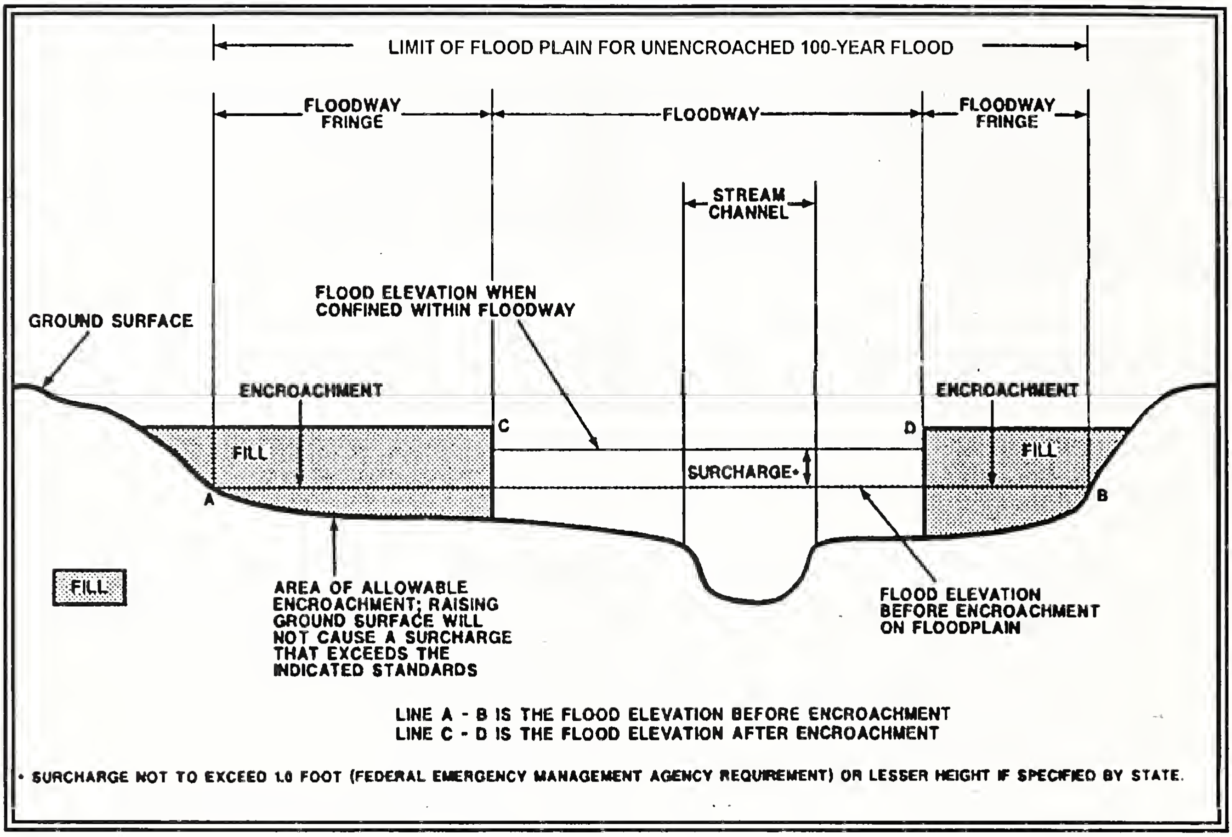

Figure 2 – Floodway Schematic

NRCS computed theoretical floodways for each of the streams studied in Dixfield considering equal flow reduction from each side of the flood plain. Floodway widths were computed at each cross section. Between cross sections, the floodway boundaries were interpolated. The computed floodways are shown on the Flood Hazard Area Maps (Appendix A). In cases where the floodway and 100-year flood plain boundaries are either close together or collinear, only the floodway boundary is shown. Floodway data for selected cross sections is presented in Table 6 “Floodway Data”.

Table 6 - FLOODWAY DATA

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	SECTION WIDTH (FEET)	AREA (SQ FT)	MEAN VELOCITY (FPS)	REGULATORY	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY (FEET NGVD)	INCREASE
SEVENMILE STREAM								
A	445[1]	314	1,281	6.8	424.9	424.9	425.8	0.9
B	2,935[1]	179	1,114	6.1	439.7	439.7	440.6	0.9
C	5,898[1]	204	1,029	6.6	467.1	467.1	468.1	1.0
D	7,748[1]	59	434	11.3	485.5	485.5	486.3	0.8
E	9,548[1]	78	461	10.7	507.8	507.8	508.8	1.0
F	13,104[1]	38	365	11.0	543.1	543.1	544.1	1.0
G	15,269[1]	153	613	5.3	559.5	559.5	560.4	0.9
TUCKER VALLEY BROOK								
A	975[2]	41	187	8.9	449.3	449.3	450.2	0.9
B	3,480[2]	28	148	9.6	522.6	522.6	523.0	0.4
C	6,000[2]	66	187	8.2	602.7	602.7	603.5	0.8
HUGH BROOK								
A	540[2]	24	134	11.5	531.7	531.7	532.7	1.0
B	1,465[2]	18	109	13.2	561.8	561.8	562.7	0.9
BUTTERFIELD BROOK								
A	850[2]	52	171	4.8	473.8	473.8	474.8	1.0
POTASH BROOK								
A	200[2]	19	101	3.4	489.8	487.3[3]	488.3	1.0

[1]Feet above town line
[2]Feet above confluence with Sevenmile Stream.
[3]Elevation computed without consideration of backwater effects of Sevenmile Stream.

Table 6 - FLOODWAY DATA

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	SECTION WIDTH (FEET)	AREA (SQ FT)	MEAN VELOCITY (FPS)	REGULATORY	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY (FEET NGVD)	INCREASE
NEWTON BROOK								
A	300[1]	184	935	2.9	409.2	393.5[2]	394.4	0.9
B	3,470[1]	315	1,765	1.7	409.2	400.8[2]	401.3	0.5
C	6,775[1]	37	368	5.7	409.2	405.9[2]	406.6	0.7
D	13,056[1]	64	694	3.4	471.4	471.4	472.0	0.8
E	15,115[1]	90	800	2.7	474.1	474.1	475.1	1.0
F	15,715[1]	54	369	5.7	476.4	476.4	477.4	1.0
G	15,880[1]	47	175	11.0	482.1	482.1	482.3	0.2
H	18,575[1]	782	3,429	0.6	489.4	489.4	490.4	1.0
I	25,225[1]	316	1,121	1.6	500.1	500.1	501.1	1.0
J	29,410[1]	47	331	6.3	527.8	527.8	528.8	1.0
K	30,640[1]	29	163	13.0	571.9	571.9	572.7	0.8
AUNT HANNAH BROOK								
A	2,790[3]	42	235	5.6	435.7	435.7	436.6	0.9
B	3,305[3]	161	748	2.0	442.7	442.7	442.7	0.0
HARVEY BROOK								
A	501[1]	82	669	2.2	406.8	392.2[2]	392.6	0.4
B	901[1]	82	628	2.3	406.8	392.5[2]	392.8	0.3
PADDY MEADOW BROOK								
A	3,125[3]	69	410	1.1	458.4	458.4	458.8	0.4

[1]Feet above confluence with Androscoggin River.
[2]Elevation computed without consideration of backwater effects Androscoggin River.
[3]Feet above confluence with Webb River.

6. Warning Signs and Flood Markers

One proven method of discouraging flood plain development is to erect flood warning signs or markers in floodprone areas or to prominently post previous or predicted flood levels. This is a viable option for some stream crossings in Dixfield. These markers carry no enforcement, but simply serve to inform the public that a significant flood hazard exists.

7. Flood Warning and Response Systems

Flood warning and response systems use rainfall and channel water level information from upstream areas to predict flood stages downstream and provide early warning of a flood. This provides time for residents in the flood plain and emergency management agencies to evacuate people, animals, and belongings and otherwise prepare for the flood.

The drainage areas for the streams in Dixfield are too small and steep for such a system to provide timely warning of flood danger. In other words, the flood peak would occur about the same time as the system would sound the alarm.

8. Existing Roads

Table 4, **Bridge and Culvert Data**, shows the effects of flooding on bridges and culverts. Any planned road, culvert, or bridge work must involve detailed modeling of flood flows to determine the effects of flood heights on planned improvements and existing buildings in the flood plain. Raising roads may induce higher flood heights on buildings located next to the road.

The Town needs to explore the cost-to-benefit ratio for any planned road work.

Structural Measures

Structural measures generally include such options as dams, channel work, removal of channel restrictions, and dikes. They require in-depth engineering, environmental, and economic analyses beyond the scope of this study to determine feasibility. Structural measures tend to have significant environmental impacts. The following discussion considers each measure as it might apply to Dixfield.

1. Dams

Dams control flood flows by temporarily storing storm runoff in a reservoir and releasing it slowly after the storm has passed. Dams are expensive to build and have significant environmental impacts. A flood control dam could not be justified based on the damages in the areas studied.

2. Channel Work

The purpose of channel work is to improve the flood carrying capacity and reduce flood damage along a given stream segment. This work can involve changing the alignment, widening, deepening, or lining the channel.

Major channel work of any kind would be difficult to permit in Maine because of severe environmental impacts. Historically, such efforts have resulted in controversy over the effects on fishery resources. Close coordination with interested agencies and groups would be required to determine the feasibility of this option.

3. Removal of Channel Restrictions

Bridges and culverts are the primary restrictions on the streams in Dixfield. Many are undersized or have inefficient inlet configurations and act as barriers to flood flows. The result is increased flow depths upstream of the bridge or culvert. As improvement funds become available, the Town and state should take action to increase bridge and culvert openings to increase discharge capacities.

Table 3, **Summary of Discharges**, provides peak discharge data at bridge and culvert locations. Table 4, **Bridge and Culvert Data**, compares flood elevations to the low chord and road overflow elevations. The data shows that improvements are necessary, particularly on the smaller streams. The **Flood Profiles** provide a graphical presentation of the effects of these restrictions on upstream flood elevations.

State and local road maintenance crews should remove trees, sediment, ice or other debris from all bridges and culverts before spring runoff. Pay particular attention to the smaller stream crossings that have a history of flood problems.

4. Dikes

A dike is an earthen embankment used as a barrier to protect structures from flood water. Any planned dike work must involve detailed modeling of flood flows to determine the effects of flood heights on existing structures in the flood plain.

GLOSSARY

CFS or cfs - Cubic feet per second. Used to describe the amount of flow passing a given point in a stream channel. One cubic foot per second is equivalent to approximately 7.5 gallons per second.

Channel - A natural or artificial watercourse with definite bed and banks to conduct and confine flowing water.

Cross Section - A graph or plot of ground elevation across a stream valley or a portion of it, usually along a line perpendicular to the stream or direction of flow.

Erosion - The group of processes whereby soil or rock material becomes loosened or dissolved and removed from any part of the earth's surface.

Flood - An overflow or inundation onto land areas not normally covered by water that are used or usable by people. Floods usually are characterized as temporarily inundating land areas which are adjacent to a body of water such as an ocean, lake, stream, or river.

Flood Crest - The maximum stage or elevation reached by the waters of a flood at any location.

Flood Plain - The relatively flat area of lowlands adjoining the channel of a river, stream, watercourse, ocean, lake, or other body of standing water that has been or may be covered by floodwater.

Flood Plain Management - The operation of a program intended to lessen the damaging effects of floods, maintain and enhance natural values, and make effective use of water and land resources within the flood plain. It is an attempt to balance values obtainable from use of flood plains with potential losses arising from such use. Flood plain management stresses consideration of a full range of the measures potentially useful in achieving its objectives.

Flood Plain Map - A map showing the lateral extent of flooding. Maps in this report show the 10-, 100-, and 500-year flood plains.

Flood Profile - A graph that shows the relationship of water surface elevation to distance along the centerline of the channel. This report uses profiles to show the crest elevations of 10-, 50-, 100-, and 500-year floods.

Floodproofing - A combination of structural changes or adjustments to new or existing structures and facilities, their contents or their sites for the purpose of reducing or eliminating flood damages by protecting against structural failure, keeping water out, or reducing the effect of water entry.

Flood Warning - The issuance and dissemination of information about an imminent or current flood.

Floodway - That portion of the main stream channel plus any adjacent flood plain areas that must be kept free of encroachment in order that the 100-year flood can be carried without substantial increases in flood heights.

Floodway Fringe - That part of the flood plain that can be completely obstructed without increasing the 100-year flood elevation by more than 1.0 foot at any point.

Frequency - A statistical measure of how often a flood event of a given size or magnitude should, on the average, be equaled or exceeded.

Head - The height of water above any plane of reference.

Head Loss - The effect of obstructions, such as narrow bridge openings or buildings, that limit the area through which water must flow, raising the surface of the water upstream of the obstruction.

High Hazard Zone - An area, normally nearest the stream, where flooding may pose a significant risk to life and property. Areas having any one of the following conditions generally are considered high hazard:

- Areas where flood velocities exceed 5 feet per second (fps).

- Areas where flood depths are greater than 3 feet.

- Areas where the product of the velocity (in fps) and the depth (in feet) of the flood water exceeds seven.

Low Chord - The elevation at which a bridge girder first begins to reduce the flow area of the channel.

Low Hazard Zone - The area between the high hazard zone and the maximum extent of the 100-year frequency flood where the potential for loss of life and property damage is low.

Natural Values of Flood Plains - The desirable qualities of, or functions served by, flood plains including, but not limited to: water resources values (e.g. -- moderation of floods, water quality maintenance, and ground water recharge); living resource values (e.g. -- fish, wildlife, plant resources, and habitat); cultural resource values (e.g. -- open space, natural beauty, scientific study, outdoor education, and recreation); and cultivated resources values (e.g. -- agricultural, aquacultural, and forestry).

NGVD - National Geodetic Vertical Datum, formerly Mean Sea Level (MSL) 1929.

Nonstructural Measures - All flood plain management measures except structural flood control works. Examples of nonstructural measures are flood warning and preparedness systems, relocation, floodproofing, regulation, land acquisition, and public investment policy.

Relocation - Moving a building from a flood prone area by physically placing it on a vehicle and transporting it from the flood plain.

Road Overflow - The elevation of the point at which water first starts to flow over a road.

Shoreland Areas - Land within 250 feet of the normal high water mark of any pond, river, or salt water body, including a major portion of the flood plain.

Station - Distance in feet along the centerline of the existing channel, increasing in an upstream direction.

Structural Measure - Flood control works such as dams and reservoirs, dikes and floodwalls, channel alterations, and diversion channels which are designed to keep water away from specific developments or populated areas, or to reduce flooding in such areas.

Wetland - Areas that have a predominance of hydric soils and that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions.

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5. U.S. Department of Commerce, Bureau of the Census, unpublished, 1990 Census of Population, Number of Inhabitants, Maine, U.S. Government Printing Office, Washington, DC.

6. U.S. Department of the Interior, Geological Survey, 7.5 Minute Series Topographic Maps, Scale 1:24,000, Contour Interval 20 Feet -- Canton, Maine, 1967; Dixfield, Maine, 1968; East Dixfield, Maine, 1968; and Worthley Pond, Maine, 1967.

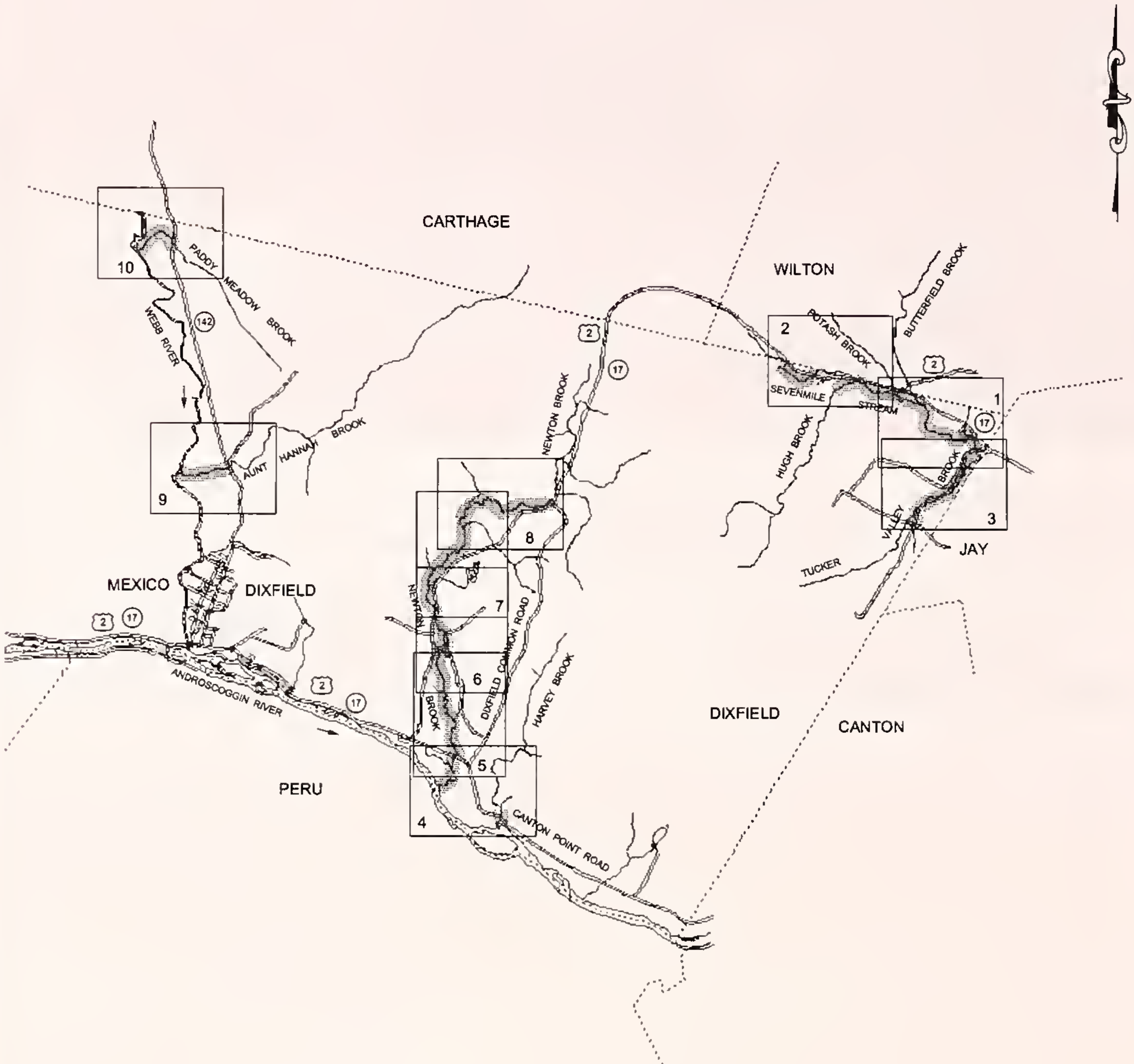
Civil Rights Impact Analysis

The NRCS official responsible for the civil rights impact analysis for this FPMS has determined that civil rights impacts have been identified and adequately addressed. No protected groups will be negatively or disproportionately impacted as a result of recommendations included in this study.

APPENDIX A
FLOOD HAZARD AREA MAPS

U.S. DEPARTMENT OF AGRICULTURE

NATURAL RESOURCES CONSERVATION SERVICE



1 SHEET COVERAGE

STREAM REACH STUDIED

LOCATION MAP

INDEX TO MAP SHEETS

DIXFIELD
FLOOD PLAIN MANAGEMENT STUDY

OXFORD COUNTY, MAINE

SOURCE:

BASE COMPILED FROM 1:24,000 USGS QUADRANGLES AND INFORMATION FROM NRCS FIELD PERSONNEL.

OCTOBER 1998

LEGEND

422 — 100-Year Flood Elevation

- - - - Floodway

(A) Valley Section Location

▲ Reference Marks

NOTE:
LIMITS OF FLOODING SHOWN MAY VARY FROM ACTUAL LOCATIONS ON THE GROUND DUE TO INHERENT AERIAL PHOTOGRAPHIC DISPLACEMENT. THE PHOTOGRAPHIC IMAGE MAY VARY FROM TRUE GROUND LOCATION.

0 500 1000
APPROXIMATE SCALE IN FEET

BASED ON 1998 USDA-NRCS AERIAL PHOTOGRAPHY

A - 1

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TOWN OF DIXFIELD
FLOOD PLAIN MANAGEMENT STUDY
OXFORD COUNTY, MAINE

FLOOD HAZARD AREA

SEVENMILE STREAM
BUTTERFIELD AND POTASH BROOKS

LEGEND

495 — 100-Year Flood Elevation

Floodway

(E) Valley Section Location

▲ Reference Marks

NOTE:
LIMITS OF FLOODING SHOWN MAY VARY FROM ACTUAL LOCATIONS ON THE GROUND DUE TO INHERENT AERIAL PHOTOGRAPHIC DISPLACEMENT. THE PHOTOGRAPHIC IMAGE MAY VARY FROM TRUE GROUND LOCATION.

0 500 1000
APPROXIMATE SCALE IN FEET

A - 2

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TOWN OF DIXFIELD
FLOOD PLAIN MANAGEMENT STUDY
OXFORD COUNTY, MAINE

FLOOD HAZARD AREA

SEVENMILE STREAM & HUGH BROOK

BASED ON 1998 USDA-NRCS AERIAL PHOTOGRAPHY

LEGEND

428 100-Year Flood Elevation

Floodway

Valley Section Location

Reference Marks

NOTE:
LIMITS OF FLOODING SHOWN MAY VARY FROM ACTUAL LOCATIONS ON THE GROUND DUE TO INHERENT AERIAL PHOTOGRAPHIC DISPLACEMENT. THE PHOTOGRAPHIC IMAGE MAY VARY FROM TRUE GROUND LOCATION.

0 500 1000

APPROXIMATE SCALE IN FEET

A - 3

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TOWN OF DIXFIELD
FLOOD PLAIN MANAGEMENT STUDY
OXFORD COUNTY, MAINE

FLOOD HAZARD AREA

TUCKER VALLEY BROOK

BASED ON 1998 USDA-NRCS AERIAL PHOTOGRAPHY

LEGEND

407 — 100-Year Flood Elevation

- - - - - Floodway

(A)— Valley Section Location

▲ Reference Marks

NOTE:
LIMITS OF FLOODING SHOWN MAY VARY FROM ACTUAL LOCATIONS ON THE GROUND DUE TO INHERENT AERIAL PHOTOGRAPHIC DISPLACEMENT. THE PHOTOGRAPHIC IMAGE MAY VARY FROM TRUE GROUND LOCATION.

0 500 1000
APPROXIMATE SCALE IN FEET

BASED ON 1998 USDA-NRCS AERIAL PHOTOGRAPHY

A - 4

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NATURAL RESOURCES CONSERVATION SERVICE
TOWN OF DIXFIELD
FLOOD PLAIN MANAGEMENT STUDY
OXFORD COUNTY, MAINE

FLOOD HAZARD AREA

NEWTON & HARVEY BROOKS

LEGEND

409 100-Year Flood Elevation

Floodway

B Velley Section Location

▲ Reference Marks

NOTE:
LIMITS OF FLOODING SHOWN MAY VARY FROM ACTUAL LOCATIONS ON THE GROUND DUE TO INHERENT AERIAL PHOTOGRAPHIC DISPLACEMENT. THE PHOTOGRAPHIC IMAGE MAY VARY FROM TRUE GROUND LOCATION.

0 500 1000
APPROXIMATE SCALE IN FEET

BASED ON 1998 USDA-NRCS AERIAL PHOTOGRAPHY

A - 5

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TOWN OF DIXFIELD
FLOOD PLAIN MANAGEMENT STUDY
OXFORD COUNTY, MAINE

FLOOD HAZARD AREA

NEWTON BROOK

BASED ON 1998 USDA-NRCS AERIAL PHOTOGRAPHY

LEGEND

433	100-Year Flood Elevation
- - - - -	Floodway
(D)	Valley Section Location
▲	Reference Marks

NOTE:
LIMITS OF FLOODING SHOWN MAY VARY FROM ACTUAL LOCATIONS ON THE GROUND DUE TO INHERENT AERIAL PHOTOGRAPHIC DISPLACEMENT. THE PHOTOGRAPHIC IMAGE MAY VARY FROM TRUE GROUND LOCATION.

0 500 1000
APPROXIMATE SCALE IN FEET

A - 6

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TOWN OF DIXFIELD
FLOOD PLAIN MANAGEMENT STUDY
OXFORD COUNTY, MAINE

FLOOD HAZARD AREA

NEWTON BROOK

LEGEND

486 (wavy line)	100-Year Flood Elevation	(H)	Valley Section Location
- - - - -	Floodway	▲	Reference Marks

NOTE:
LIMITS OF FLOODING SHOWN MAY VARY FROM ACTUAL LOCATIONS ON THE GROUND DUE TO INHERENT AERIAL PHOTOGRAPHIC DISPLACEMENT. THE PHOTOGRAPHIC IMAGE MAY VARY FROM TRUE GROUND LOCATION.

0 500 1000
APPROXIMATE SCALE IN FEET

A - 7

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TOWN OF DIXFIELD
FLOOD PLAIN MANAGEMENT STUDY
OXFORD COUNTY, MAINE

FLOOD HAZARD AREA

NEWTON BROOK

BASED ON 1998 USDA NRCS AERIAL PHOTOGRAPHY

LEGEND

497 (wavy line)	100-Year Flood Elevation	(I)	Valley Section Location
- - - - -	Floodway	▲	Reference Marks

NOTE:
LIMITS OF FLOODING SHOWN MAY VARY FROM ACTUAL LOCATIONS ON THE GROUND DUE TO INHERENT AERIAL PHOTOGRAPHIC DISPLACEMENT. THE PHOTOGRAPHIC IMAGE MAY VARY FROM TRUE GROUND LOCATION.

0 500 1000
APPROXIMATE SCALE IN FEET

A - 8

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TOWN OF DIXFIELD
FLOOD PLAIN MANAGEMENT STUDY
OXFORD COUNTY, MAINE

FLOOD HAZARD AREA

NEWTON BROOK

BASED ON 1998 USDA-NRCS AERIAL PHOTOGRAPHY

BASED ON 1998 USDA-NRCS AERIAL PHOTOGRAPHY

LEGEND

434 100-Year Flood Elevation

Floodway

(A) Valley Section Location

▲ Reference Marks

NOTE:
LIMITS OF FLOODING SHOWN MAY VARY FROM ACTUAL LOCATIONS ON THE GROUND DUE TO INHERENT AERIAL PHOTOGRAPHIC DISPLACEMENT. THE PHOTOGRAPHIC IMAGE MAY VARY FROM TRUE GROUND LOCATION.

0 500 1000
APPROXIMATE SCALE IN FEET

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TOWN OF DIXFIELD
FLOOD PLAIN MANAGEMENT STUDY
OXFORD COUNTY, MAINE

FLOOD HAZARD AREA

AUNT HANNAH BROOK

A - 9

LEGEND

435 — 100-Year Flood Elevation

Floodway

(A) — Valley Section Location

▲ Reference Marks

NOTE:
LIMITS OF FLOODING SHOWN MAY VARY FROM ACTUAL LOCATIONS ON THE GROUND DUE TO INHERENT AERIAL PHOTOGRAPHIC DISPLACEMENT. THE PHOTOGRAPHIC IMAGE MAY VARY FROM TRUE GROUND LOCATION.

0 500 1000
APPROXIMATE SCALE IN FEET

BASED ON 1998 USDA-NRCS AERIAL PHOTOGRAPHY

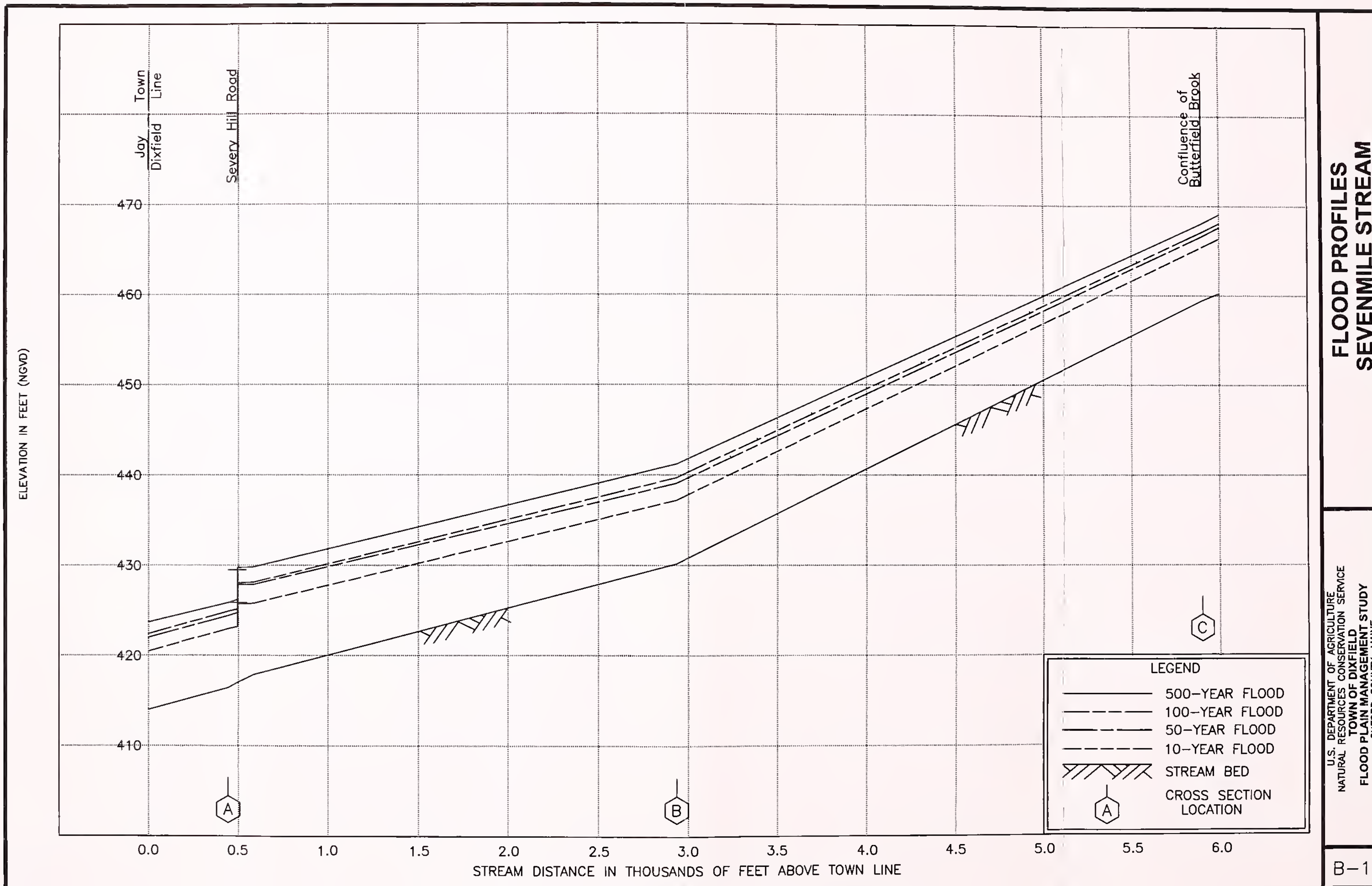
A - 10

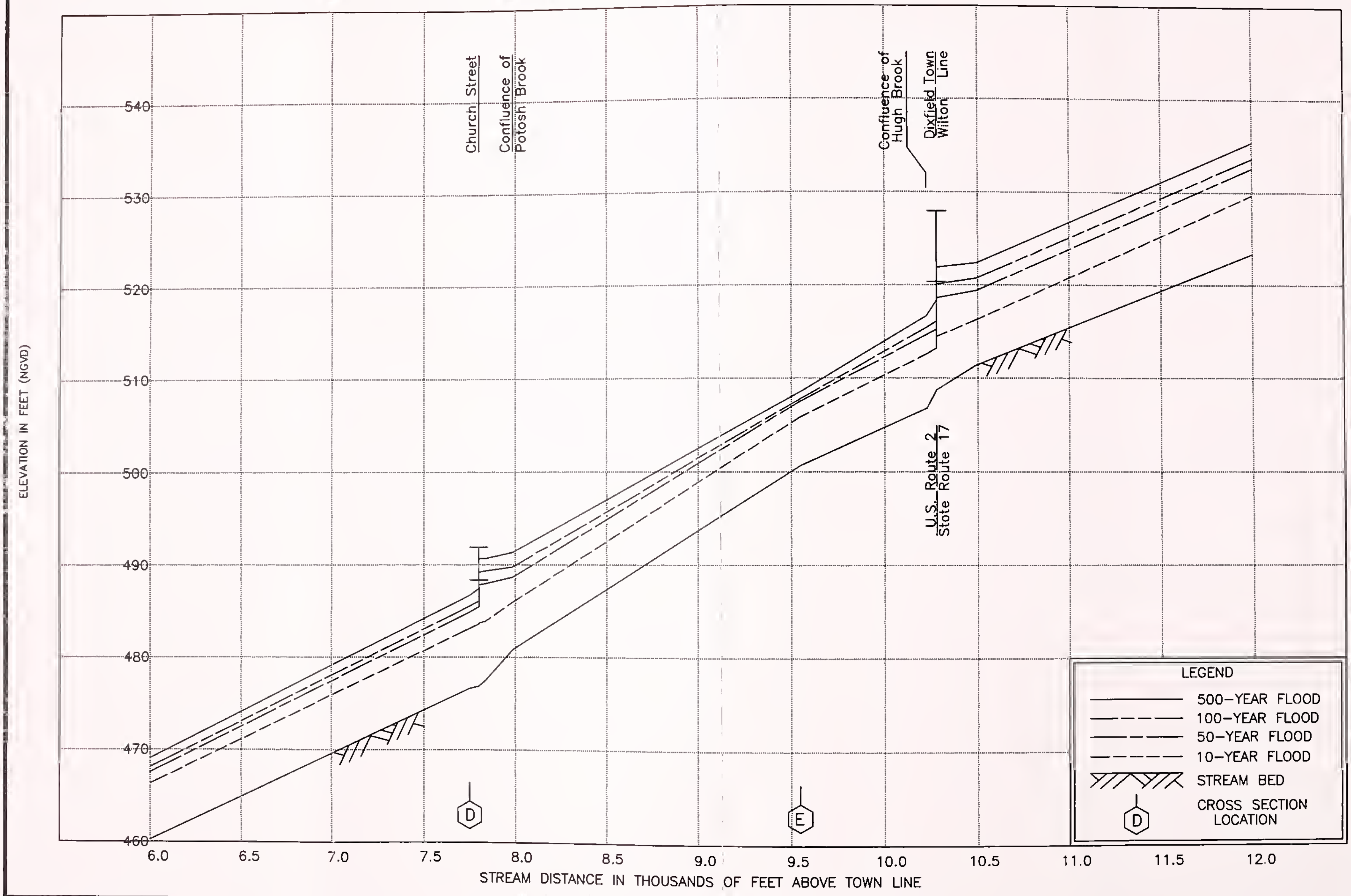
U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TOWN OF DIXFIELD
FLOOD PLAIN MANAGEMENT STUDY
OXFORD COUNTY, MAINE

FLOOD HAZARD AREA

PADDY MEADOW BROOK

APPENDIX B
FLOOD PROFILES

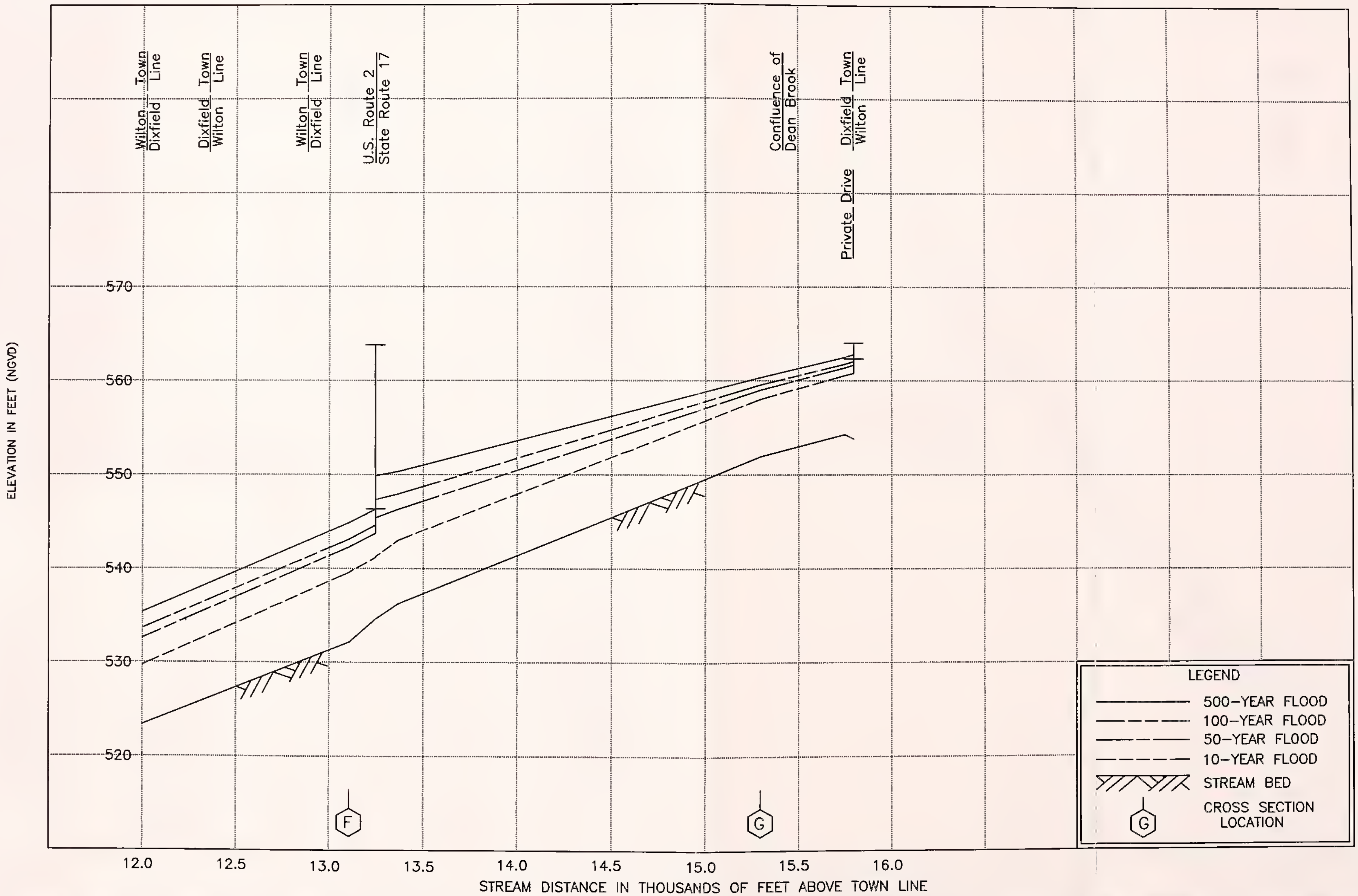

FLOOD PROFILES
SEVENMILE STREAM
U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TOWN OF DIXFIELD
FLOOD PLAIN MANAGEMENT STUDY
OXFORD COUNTY, MAINE
B-1
Jay / Dixfield Town Line
Severy Hill Road
Confluence of Butterfield Brook
ELEVATION IN FEET (NGVD)
410
420
430
440
450
460
470
STREAM DISTANCE IN THOUSANDS OF FEET ABOVE TOWN LINE
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
5.5
6.0
A
B
C
LEGEND
500-YEAR FLOOD
100-YEAR FLOOD
50-YEAR FLOOD
10-YEAR FLOOD
STREAM BED
CROSS SECTION LOCATION



FLOOD PROFILES SEVENMILE STREAM

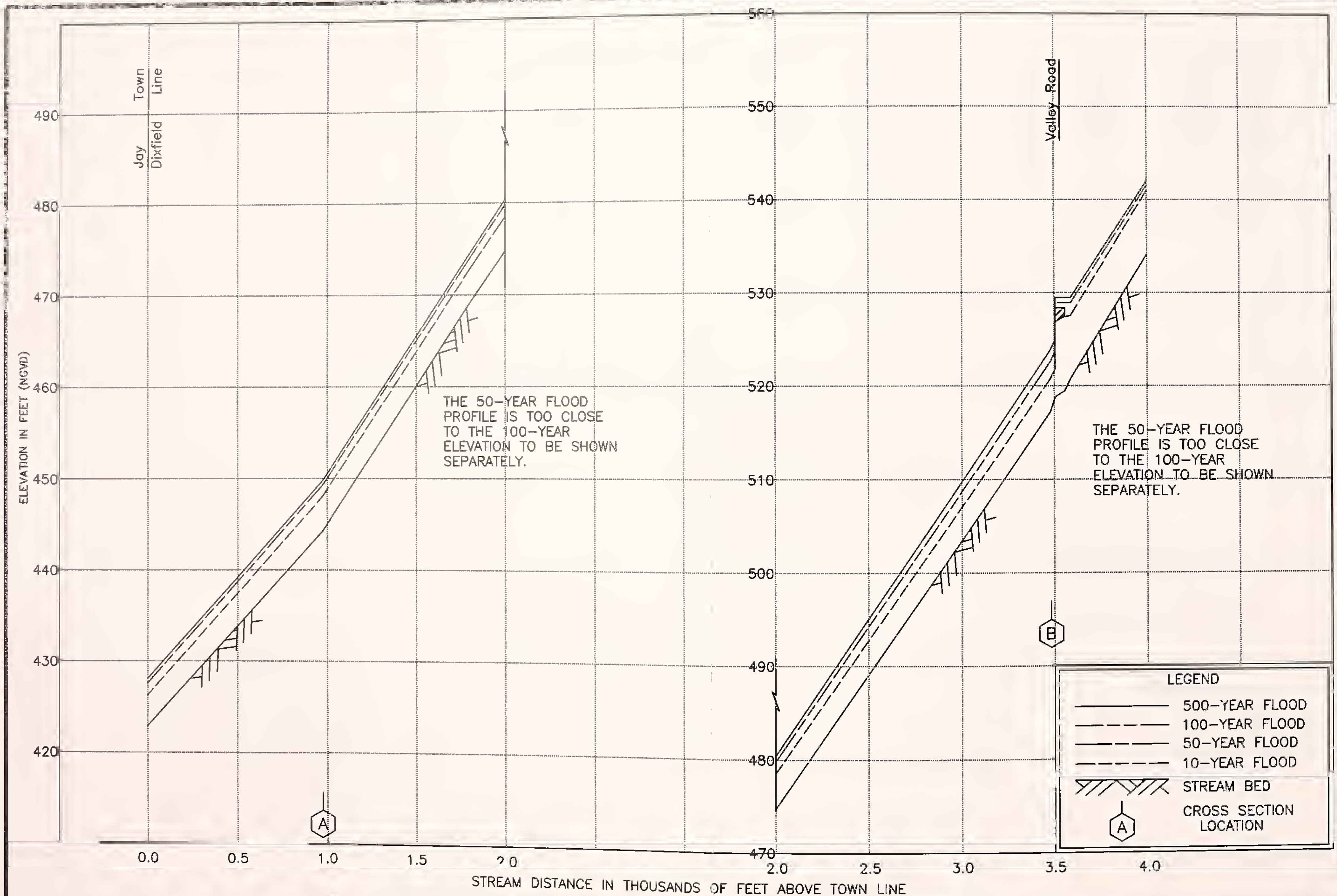
U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TOWN OF DIXFIELD
FLOOD PLAIN MANAGEMENT STUDY
OXFORD COUNTY, MAINE

B-2



FLOOD PROFILES
SEVENMILE STREAM

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TOWN OF DIXFIELD
FLOOD PLAIN MANAGEMENT STUDY
OXFORD COUNTY, MAINE

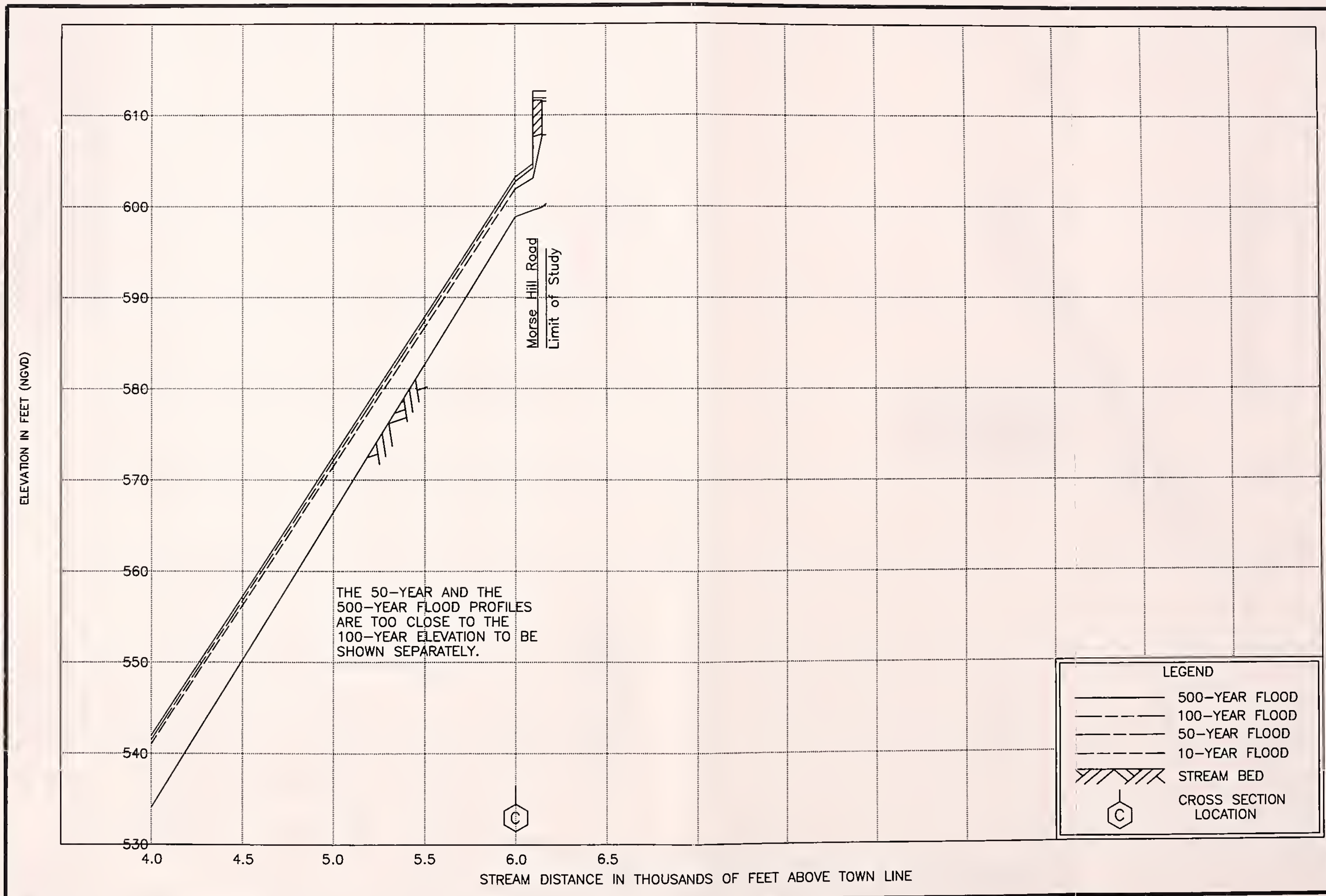


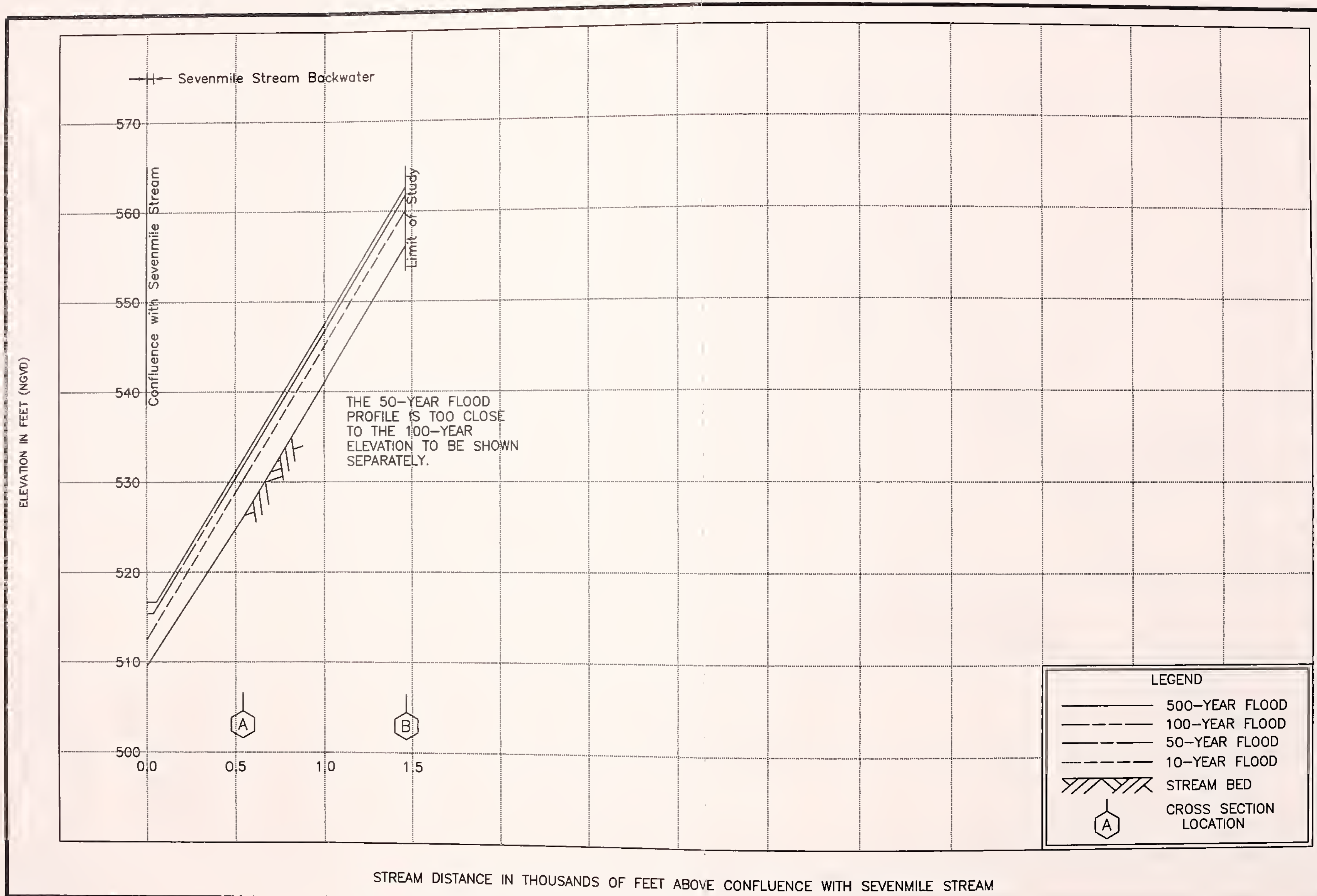
FLOOD PROFILES
TUCKER VALLEY BROOK

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TOWN OF DIXFIELD
FLOOD PLAIN MANAGEMENT STUDY
OXFORD COUNTY, MAINE

FLOOD PROFILES
TUCKER VALLEY BROOK

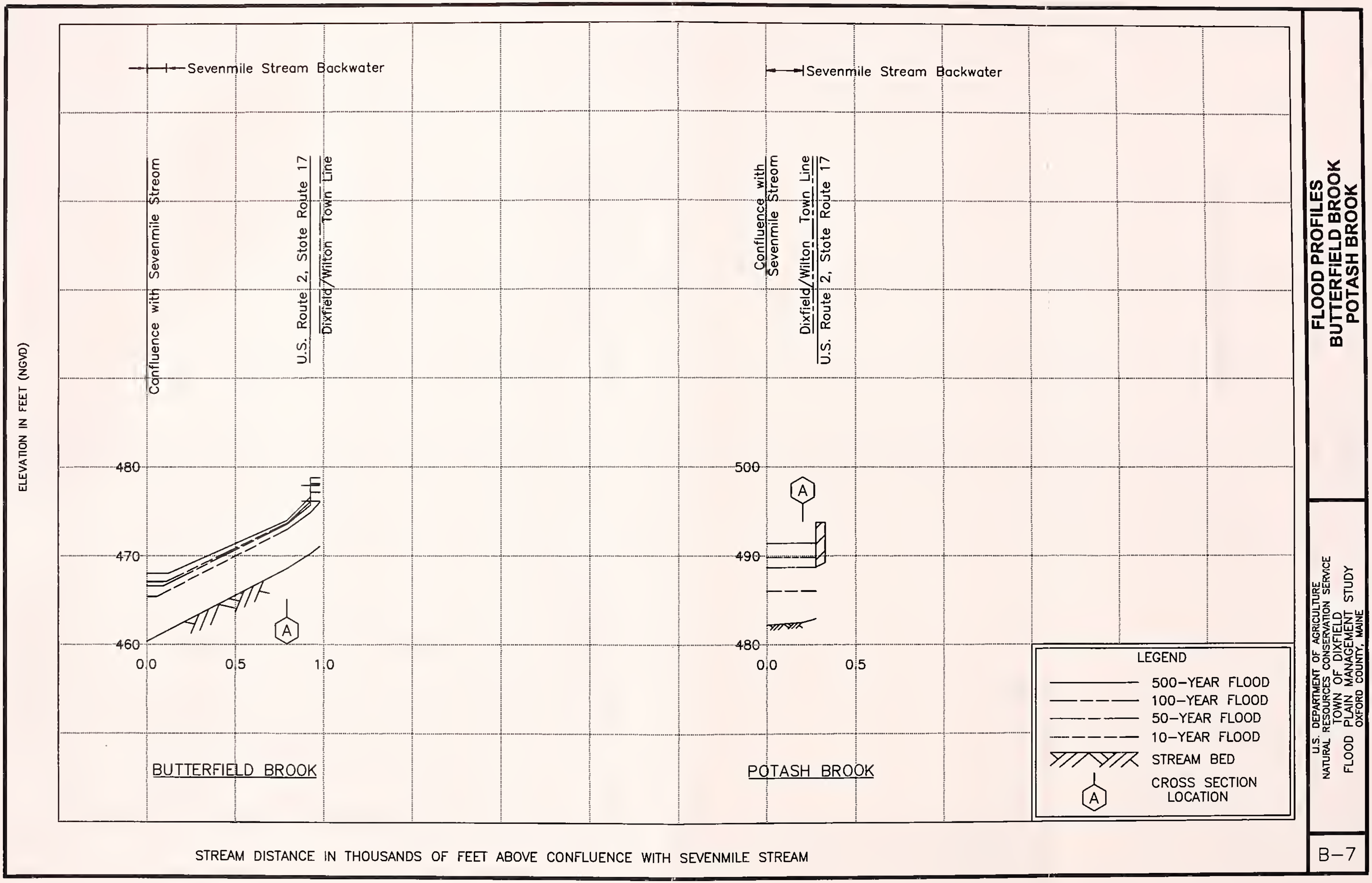
U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TOWN OF DIXFIELD
FLOOD PLAIN MANAGEMENT STUDY
OXFORD COUNTY, MAINE



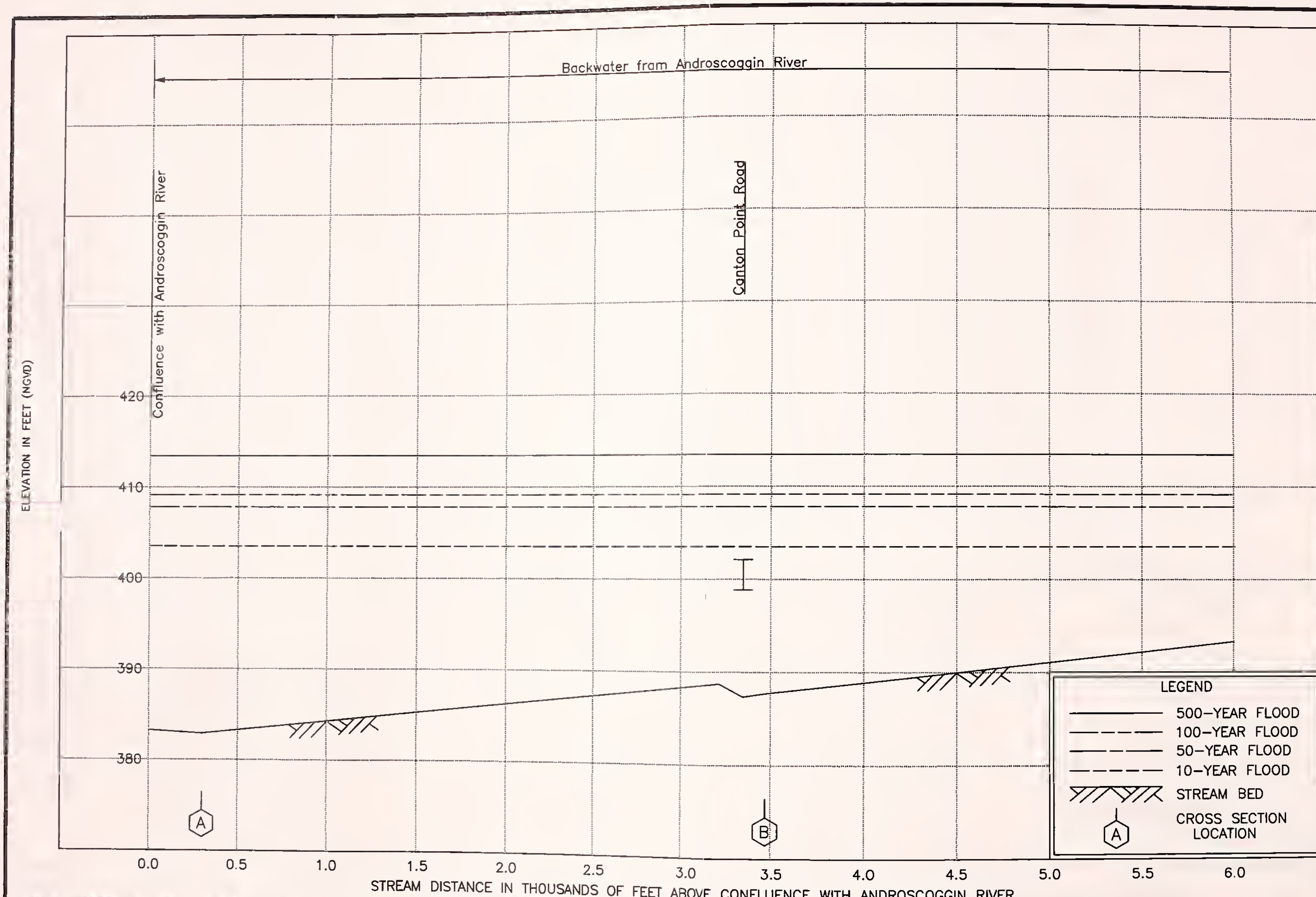


FLOOD PROFILES
HUGH BROOK

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TOWN OF DIXFIELD
FLOODPLAIN MANAGEMENT STUDY
OXFORD COUNTY, MAINE

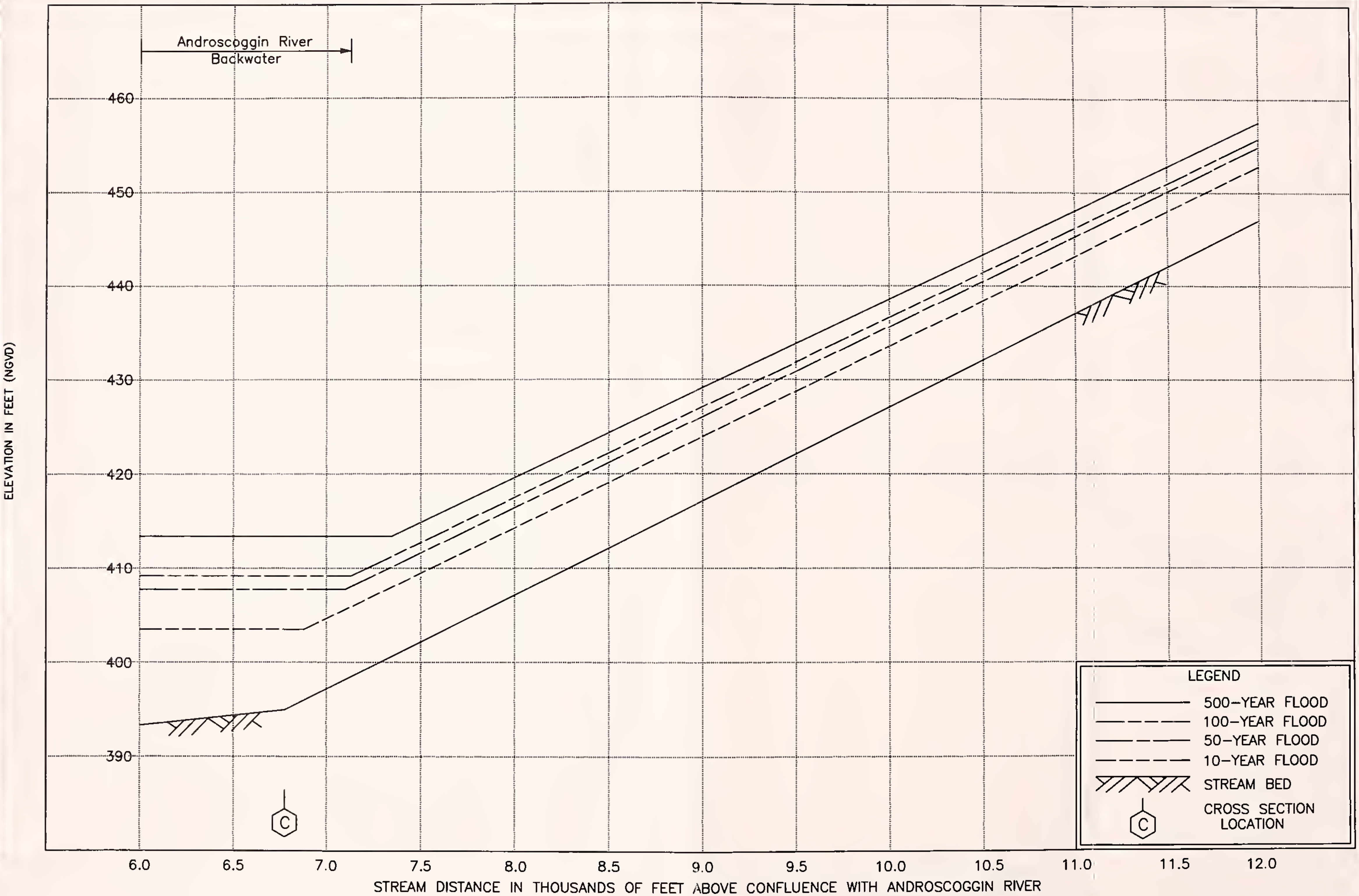


Sevenmile Stream Backwater
Confluence with Sevenmile Stream
U.S. Route 2, State Route 17
Dixfield/Wilton Town Line
Sevenmile Stream Backwater
Confluence with Sevenmile Stream
Dixfield/Wilton Town Line
U.S. Route 2, State Route 17
ELEVATION IN FEET (NGVD)
480
470
460
500
490
480
0.0
0.5
1.0
0.0
0.5
A
A
BUTTERFIELD BROOK
POTASH BROOK
LEGEND
500-YEAR FLOOD
100-YEAR FLOOD
50-YEAR FLOOD
10-YEAR FLOOD
STREAM BED
CROSS SECTION LOCATION
STREAM DISTANCE IN THOUSANDS OF FEET ABOVE CONFLUENCE WITH SEVENMILE STREAM
FLOOD PROFILES
BUTTERFIELD BROOK
POTASH BROOK
U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TOWN OF DIXFIELD
FLOOD PLAIN MANAGEMENT STUDY
OXFORD COUNTY, MAINE
B-7



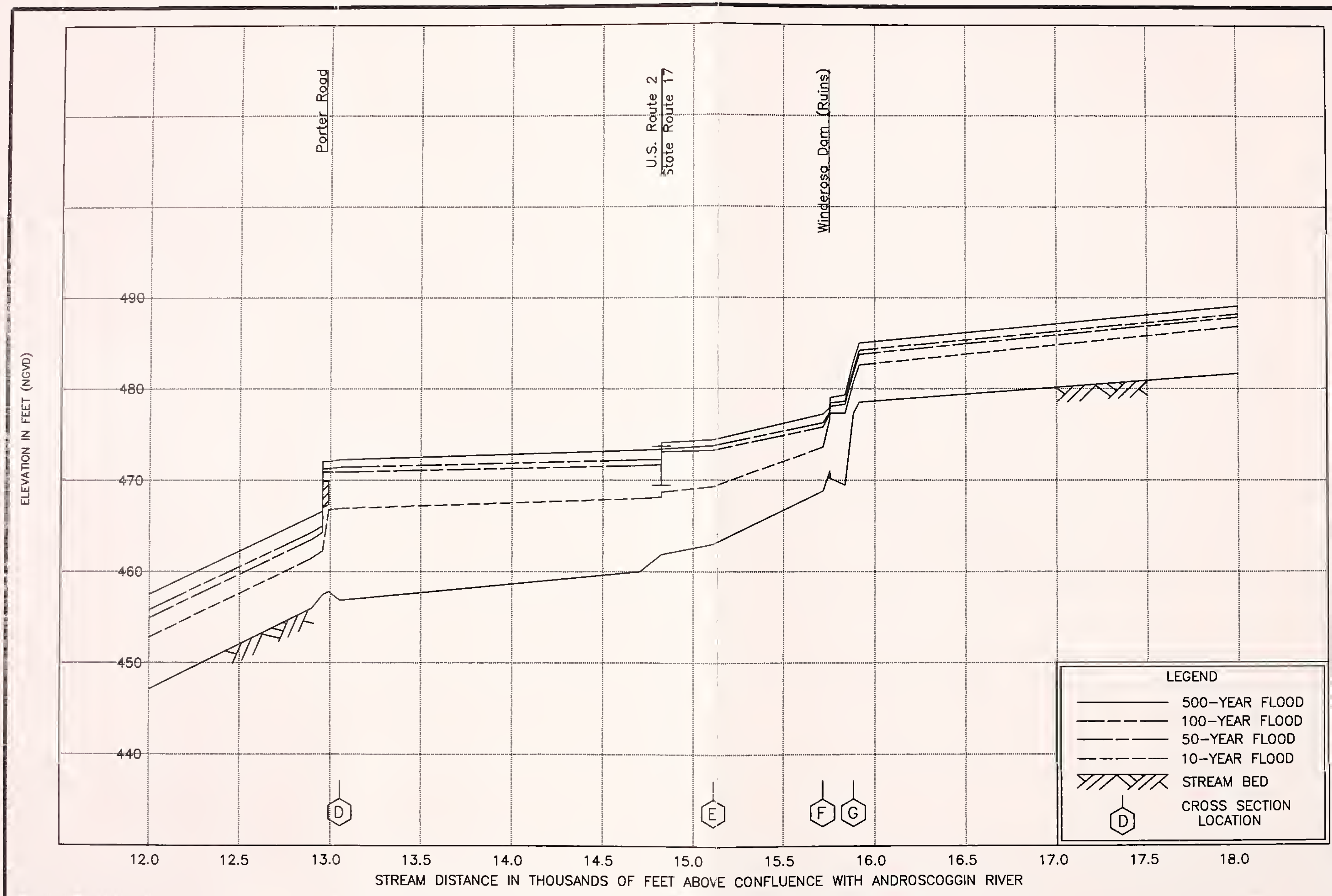
FLOOD PROFILES
NEWTON BROOK

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TOWN OF DIXFIELD
FLOOD PLAIN MANAGEMENT STUDY
OXFORD COUNTY, MAINE



FLOOD PROFILES
NEWTON BROOK

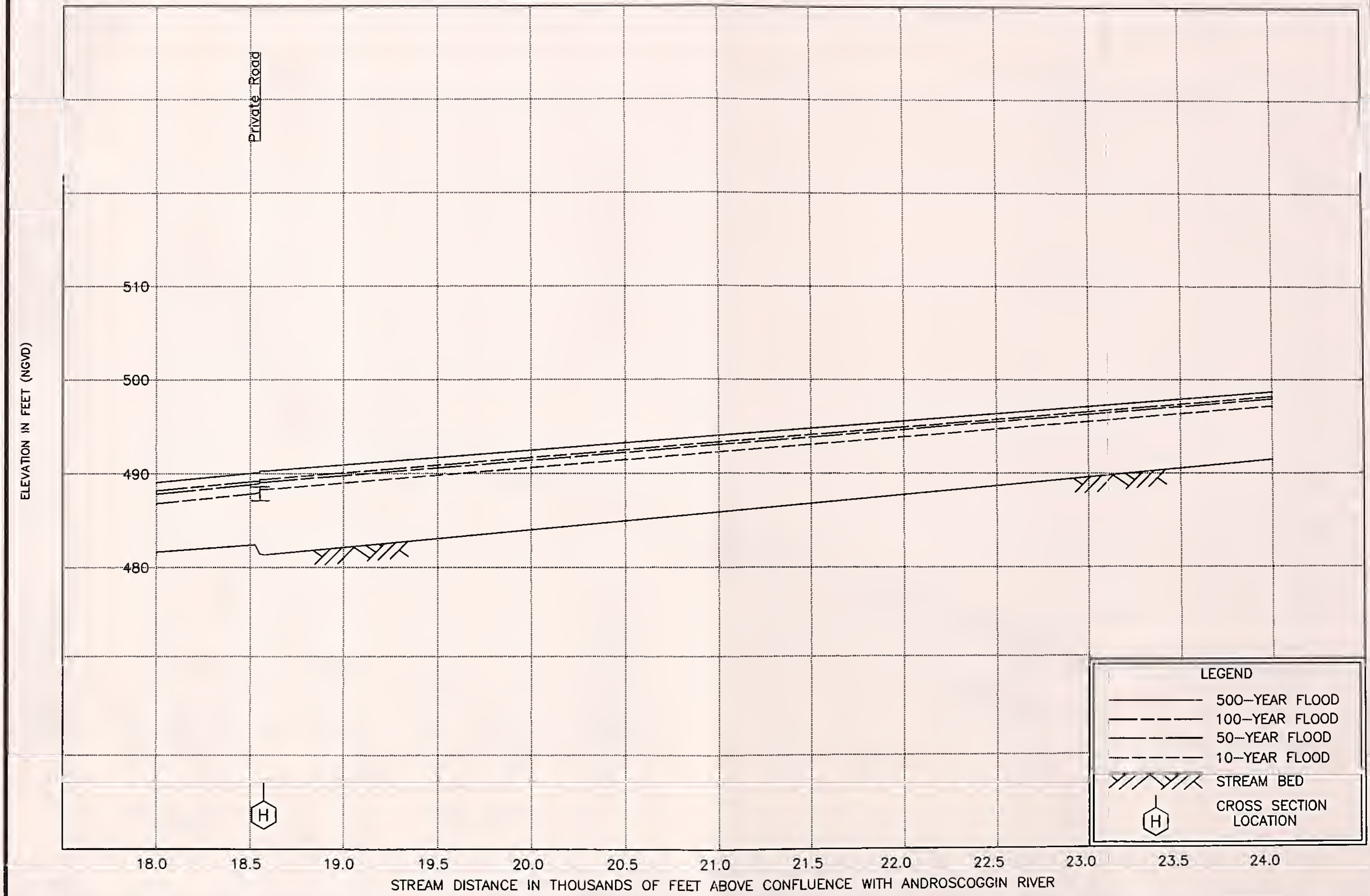
U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TOWN OF DIXFIELD
FLOOD PLAIN MANAGEMENT STUDY
OXFORD COUNTY, MAINE



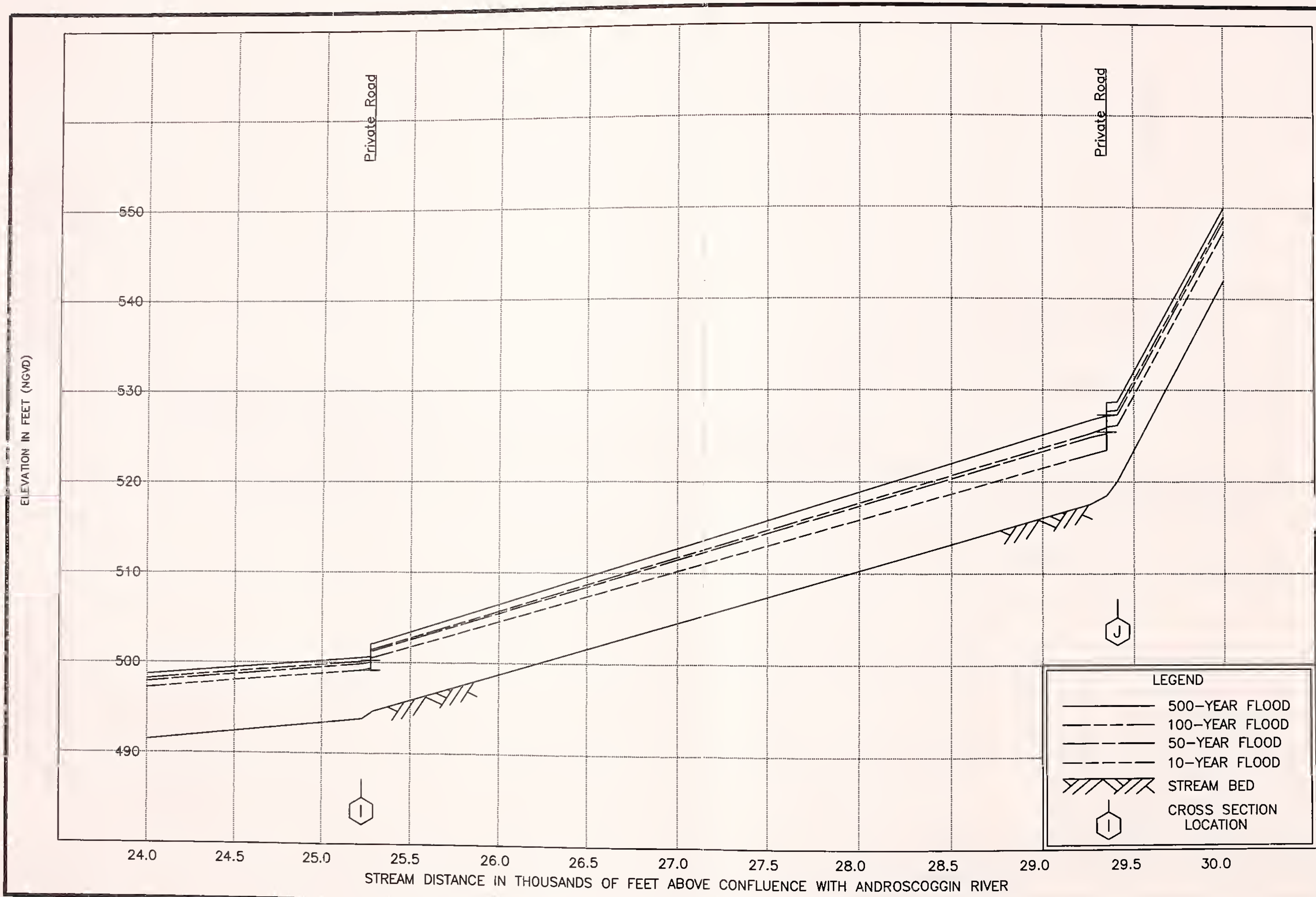
FLOOD PROFILES
NEWTON BROOK

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TOWN OF DIXFIELD
FLOOD PLAIN MANAGEMENT STUDY
OXFORD COUNTY, MAINE

FLOOD PROFILES
NEWTON BROOK

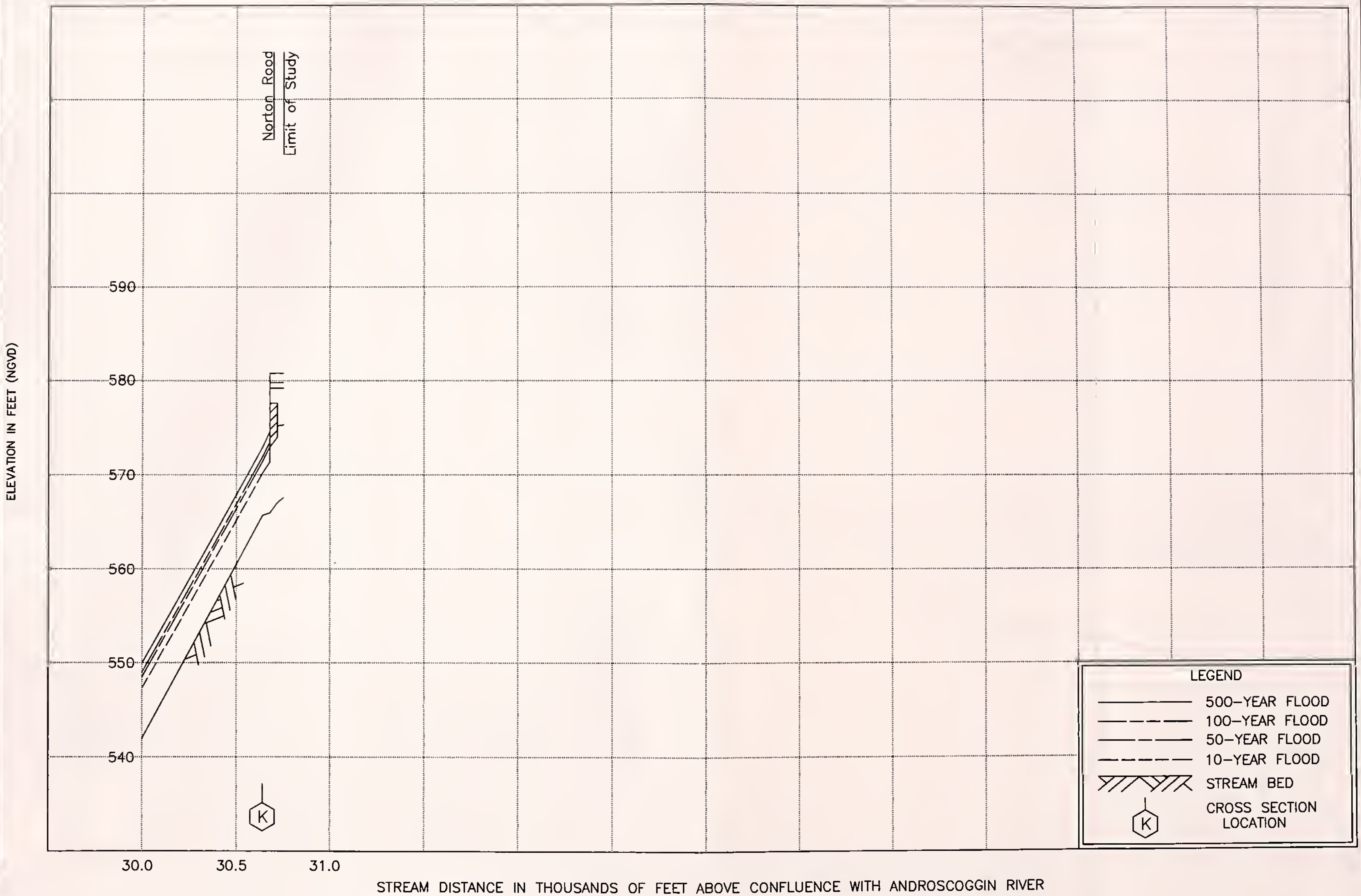


U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TOWN OF DIXFIELD
FLOOD PLAIN MANAGEMENT STUDY
OXFORD COUNTY, MAINE



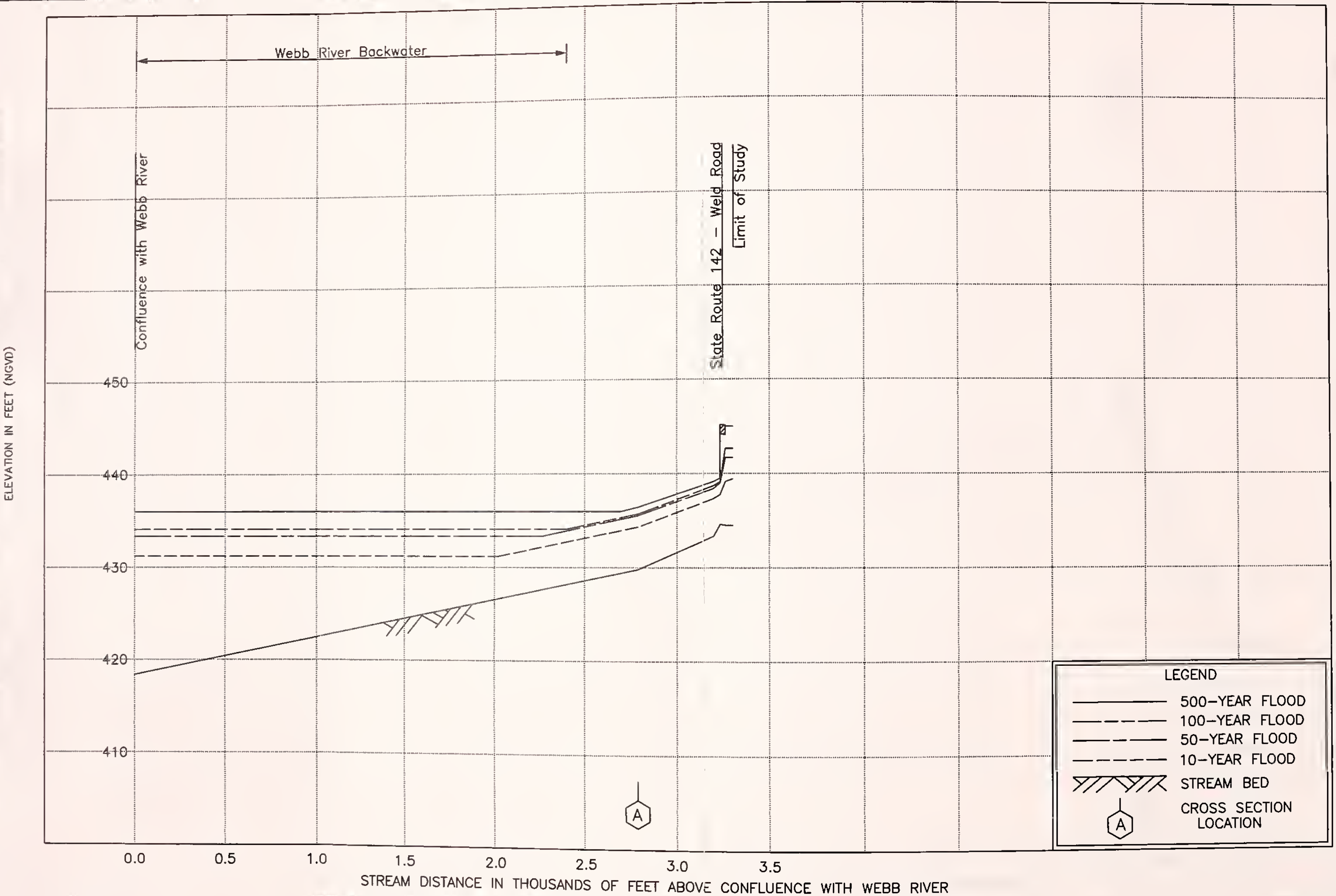
FLOOD PROFILES
NEWTON BROOK

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TOWN OF DIXFIELD
FLOOD PLAIN MANAGEMENT STUDY
OXFORD COUNTY, MAINE



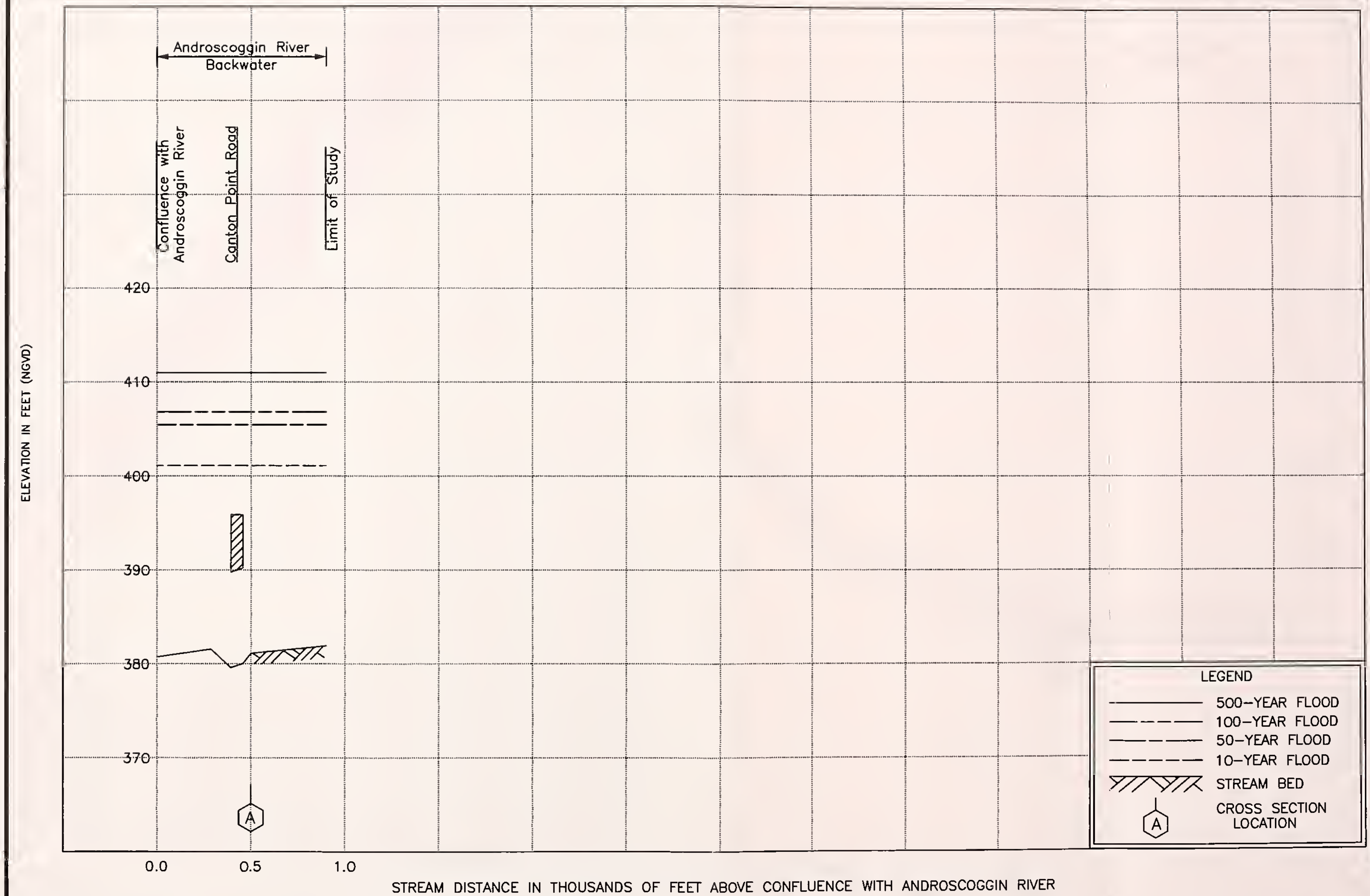
FLOOD PROFILES
NEWTON BROOK

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TOWN OF DIXFIELD
FLOOD PLAIN MANAGEMENT STUDY
OXFORD COUNTY, MAINE



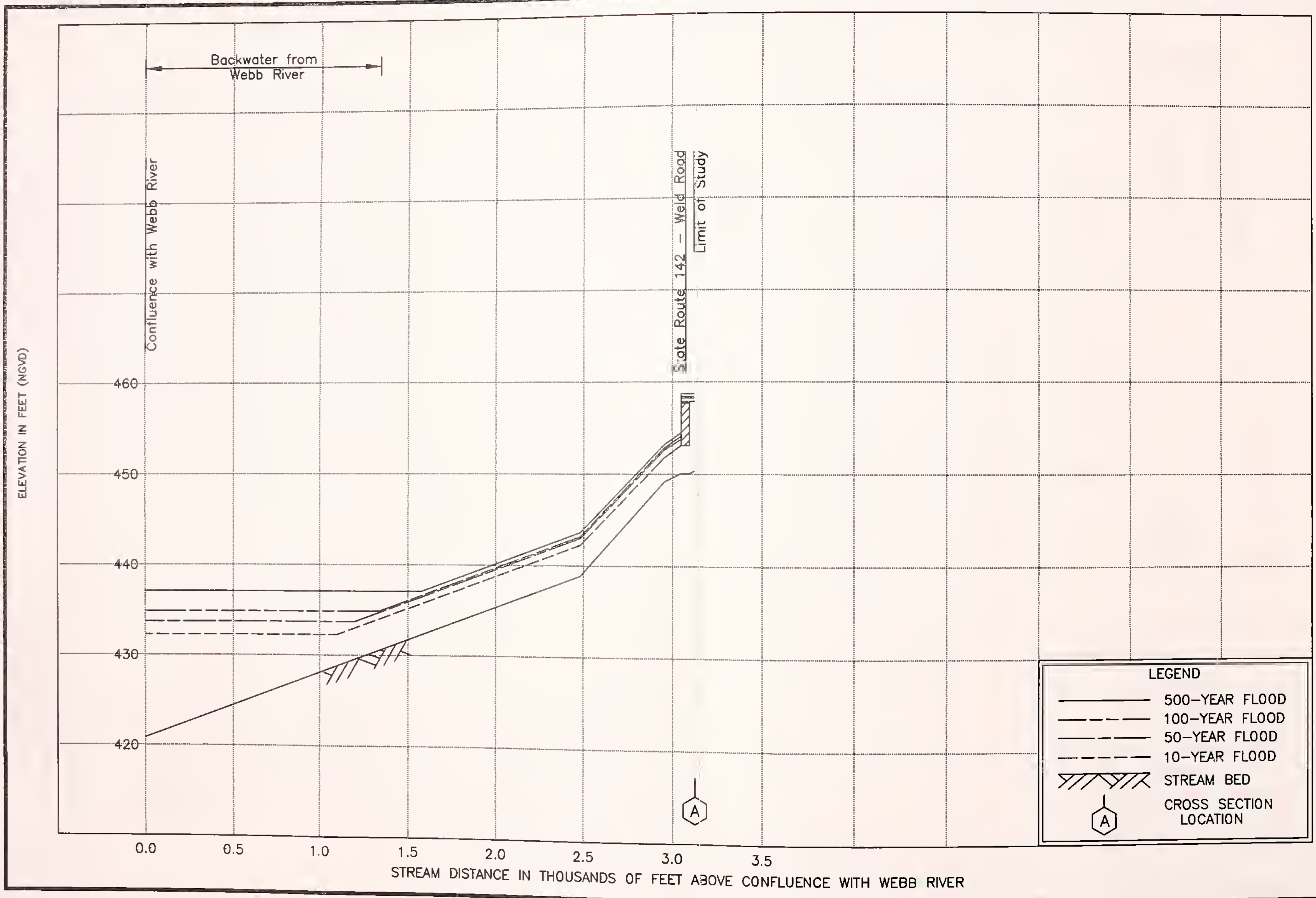
FLOOD PROFILES
AUNT HANNAH BROOK

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TOWN OF DIXFIELD
FLOOD PLAIN MANAGEMENT STUDY
OXFORD COUNTY, MAINE



FLOOD PROFILES
HARVEY BROOK

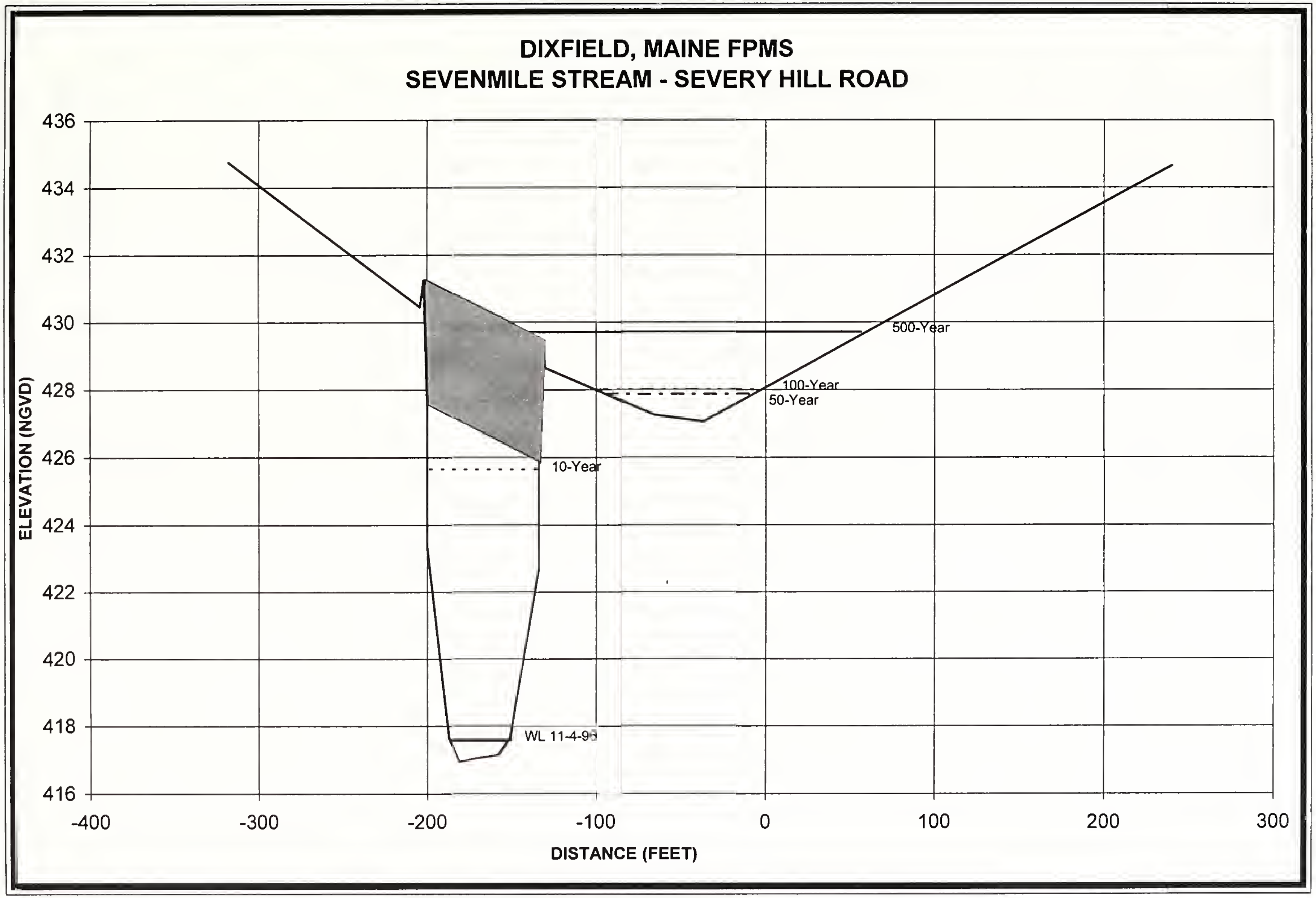
U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TOWN OF DIXFIELD
FLOOD PLAIN MANAGEMENT STUDY
OXFORD COUNTY, MAINE

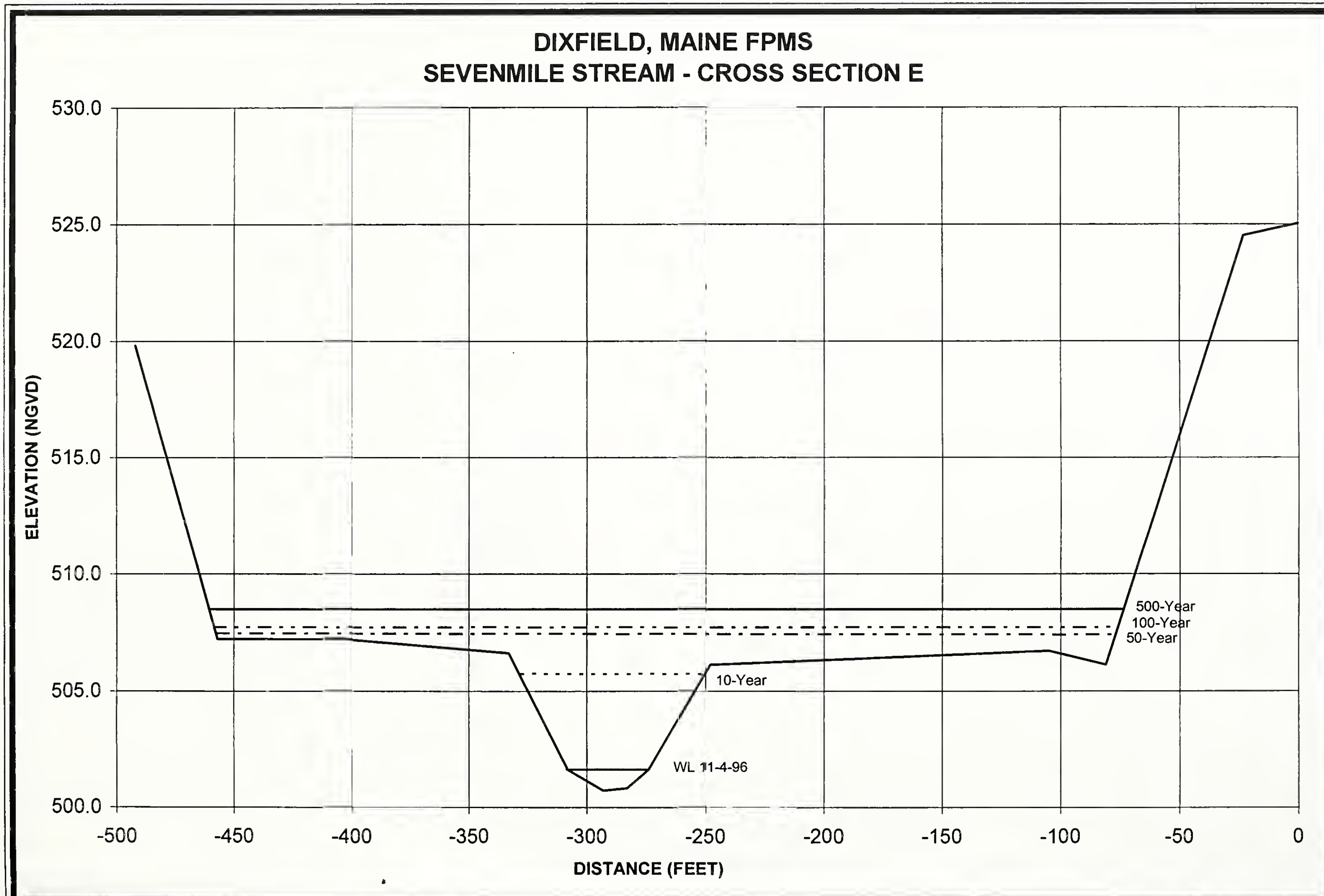


FLOOD PROFILES
PADDY MEADOW BROOK

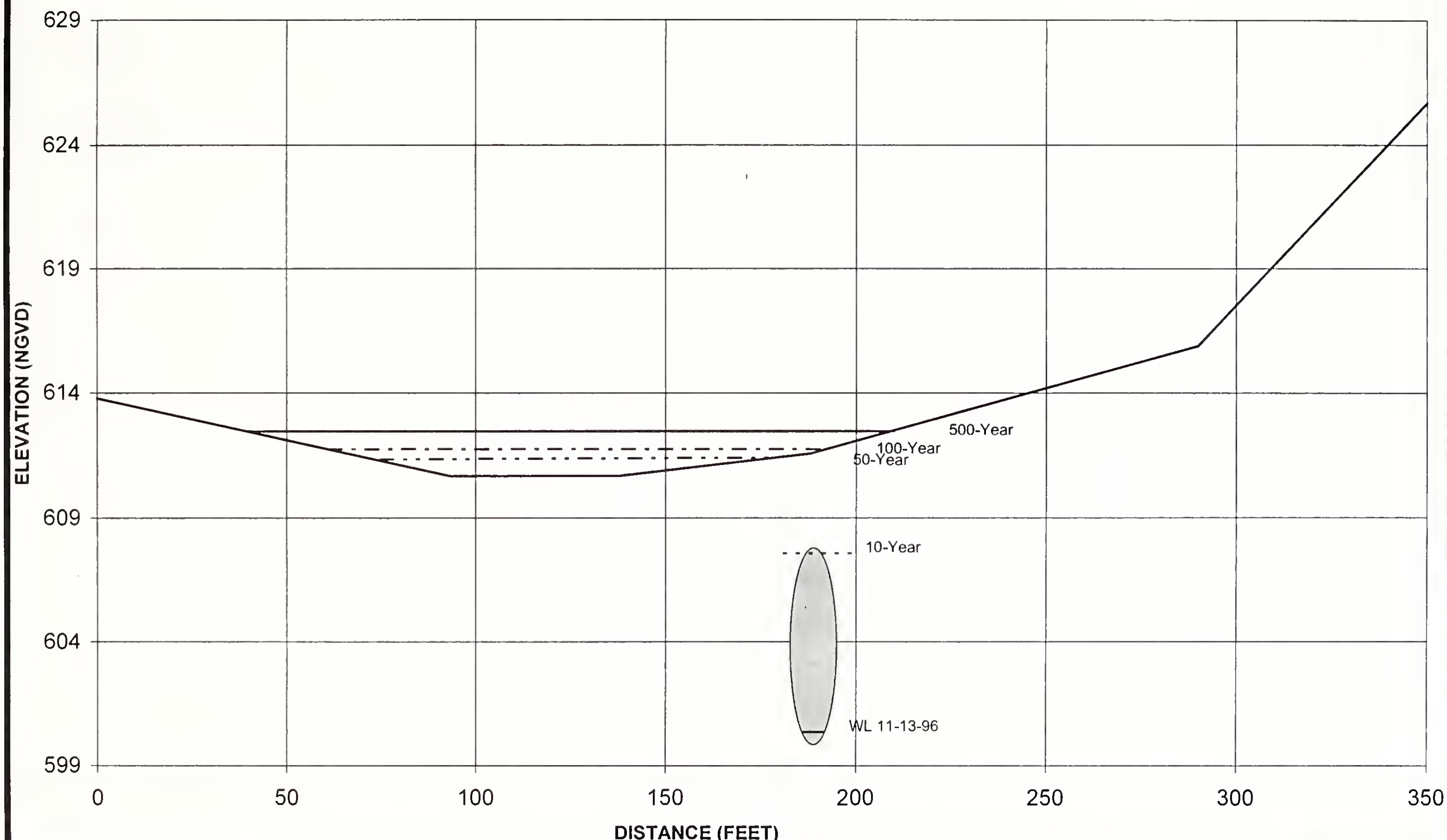
U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TOWN OF DIXFIELD
FLOOD PLAIN MANAGEMENT STUDY
OXFORD COUNTY, MAINE

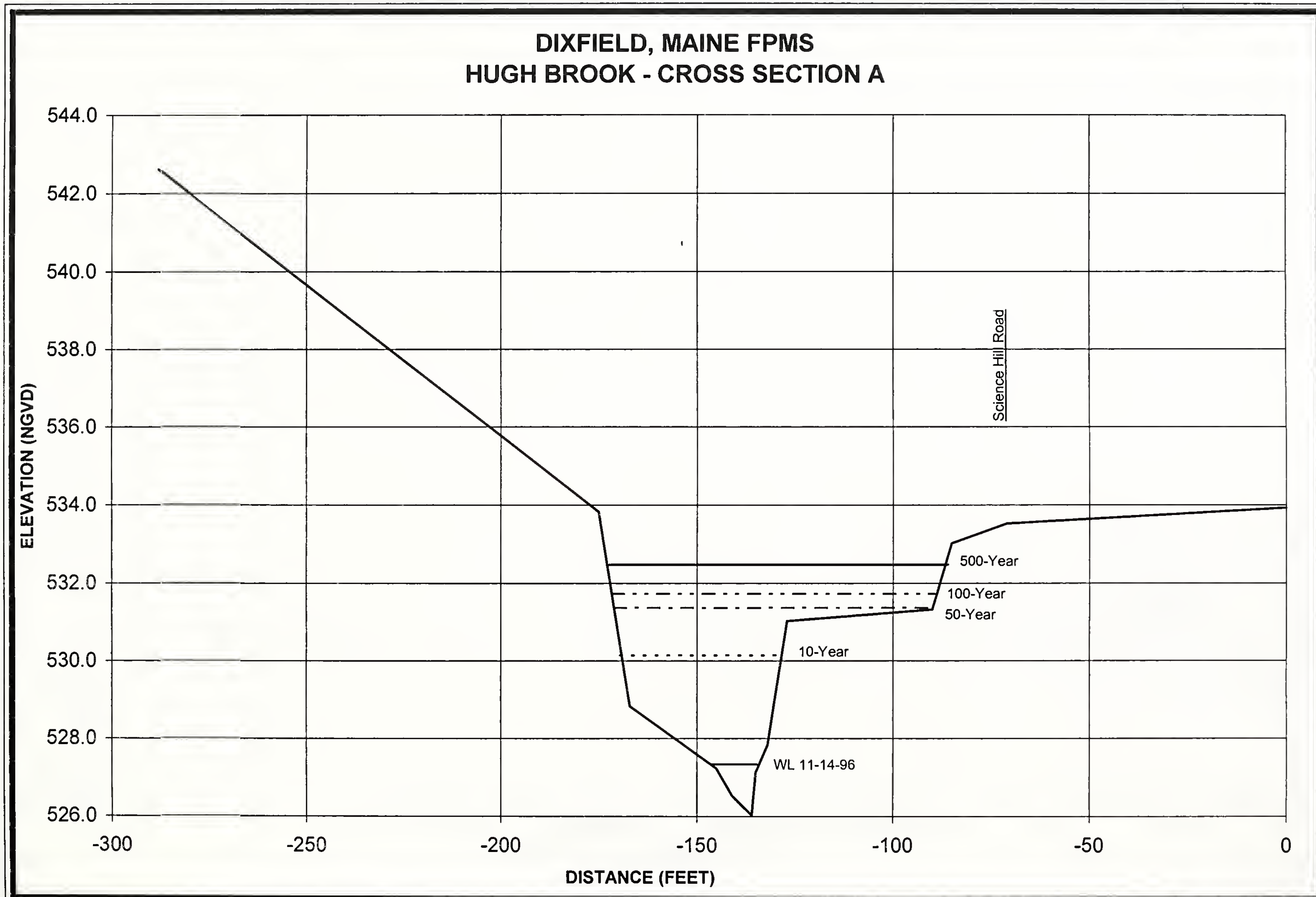
APPENDIX C
SELECTED CROSS SECTIONS


DIXFIELD, MAINE FPMS
SEVENMILE STREAM - SEVERY HILL ROAD
ELEVATION (NGVD)
436
434
432
430
428
426
424
422
420
418
416
500-Year
100-Year
50-Year
10-Year
WL 11-4-96
-400
-300
-200
-100
0
100
200
300
DISTANCE (FEET)

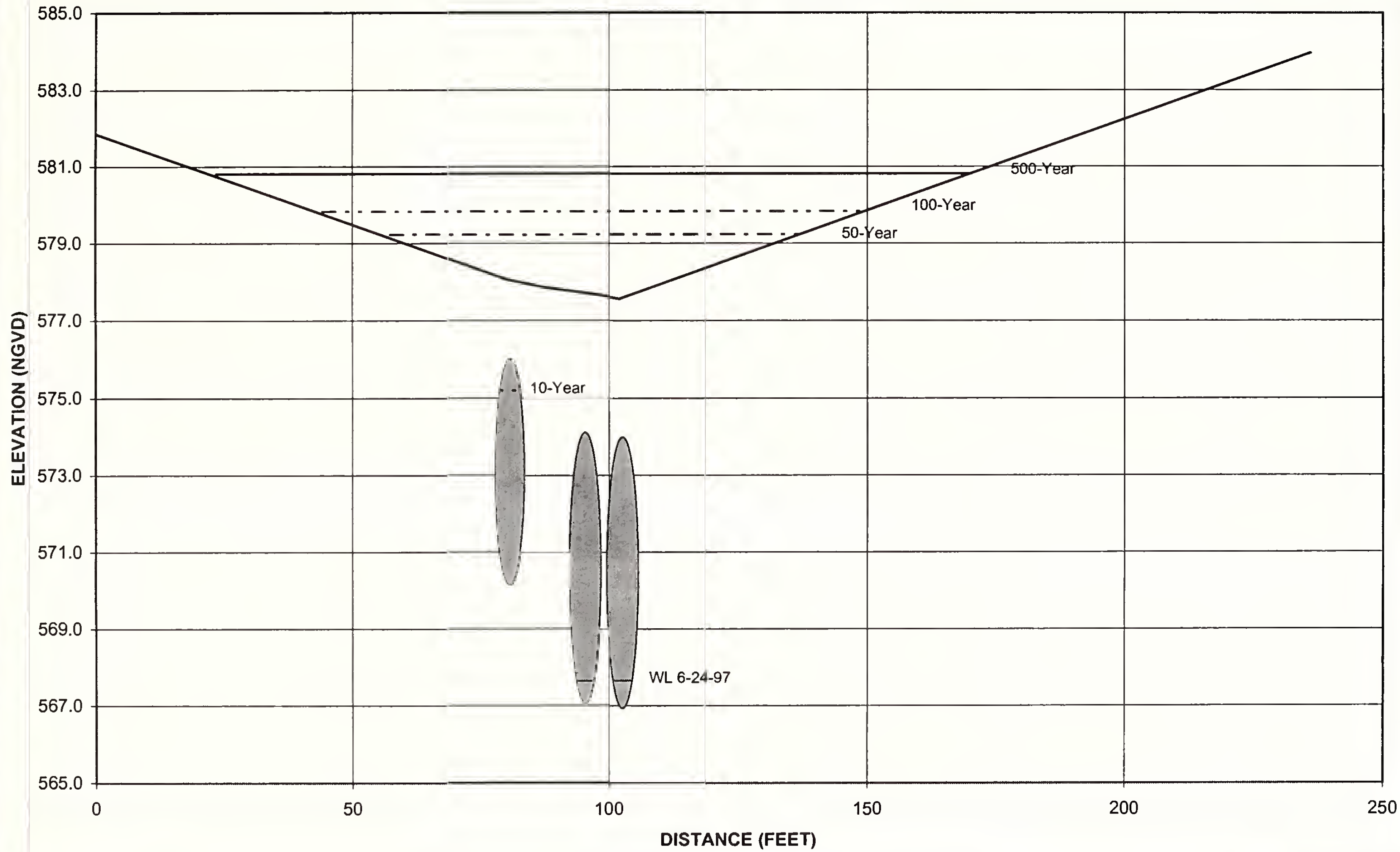

DIXFIELD, MAINE FPMS
SEVENMILE STREAM - CROSS SECTION E
ELEVATION (NGVD)
530.0
525.0
520.0
515.0
510.0
505.0
500.0
500-Year
100-Year
50-Year
10-Year
WL 11-4-96
-500
-450
-400
-350
-300
-250
-200
-150
-100
-50
0
DISTANCE (FEET)

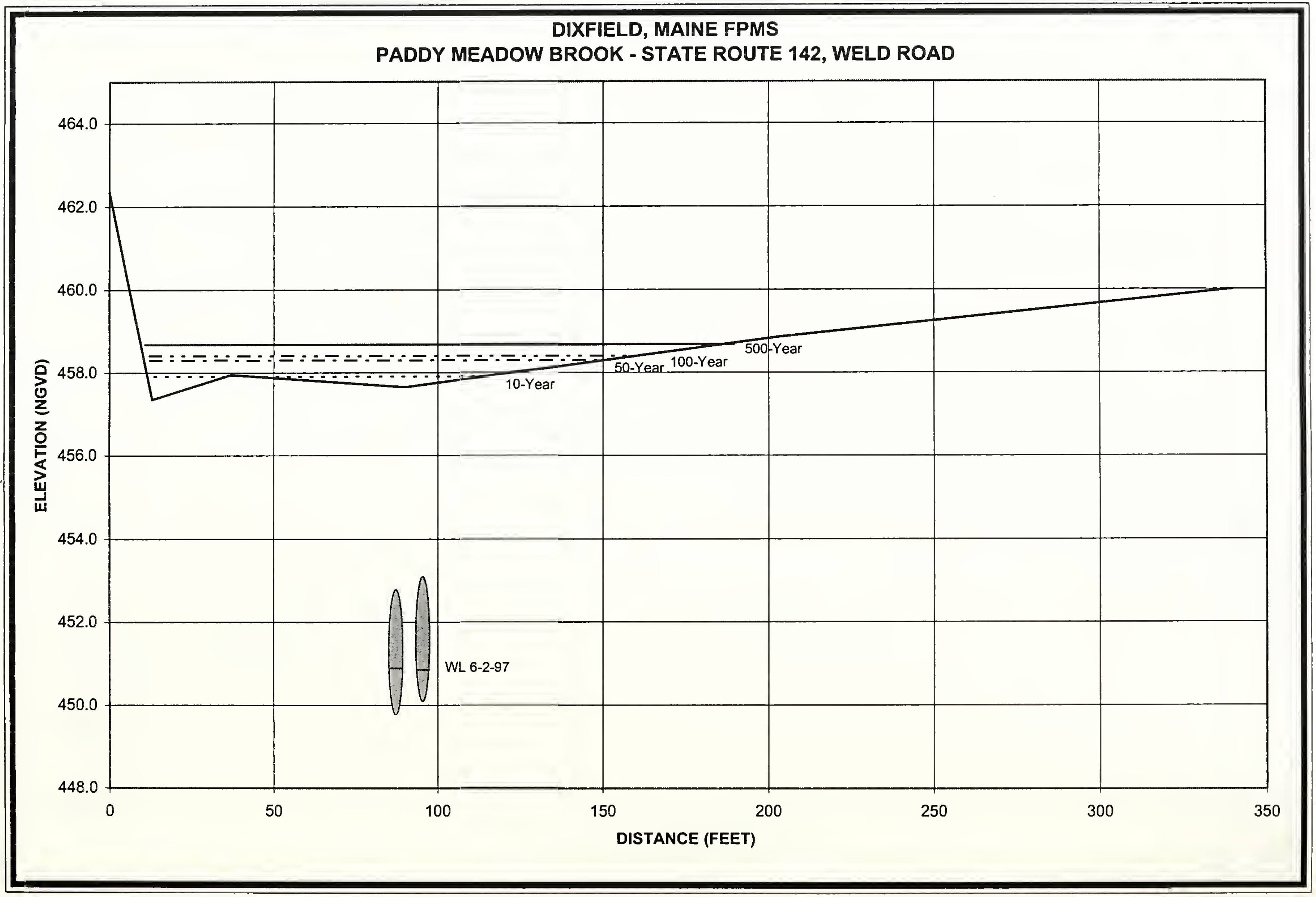
DIXFIELD, MAINE FPMS
TUCKER VALLEY BROOK - MORSE HILL ROAD




DIXFIELD, MAINE FPMS
HUGH BROOK - CROSS SECTION A
ELEVATION (NGVD)
544.0
542.0
540.0
538.0
536.0
534.0
532.0
530.0
528.0
526.0
DISTANCE (FEET)
-300
-250
-200
-150
-100
-50
0
Science Hill Road
500-Year
100-Year
50-Year
10-Year
WL 11-14-96

DIXFIELD, MAINE FPMS
NEWTON BROOK - NORTON ROAD




DIXFIELD, MAINE FPMS
PADDY MEADOW BROOK - STATE ROUTE 142, WELD ROAD
464.0
462.0
460.0
458.0
456.0
454.0
452.0
450.0
448.0
ELEVATION (NGVD)
0
50
100
150
200
250
300
350
DISTANCE (FEET)
500-Year
100-Year
50-Year
10-Year
WL 6-2-97